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AVIATION AND ASTRONAUTICS IN THE USSR

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TABLE OF CONTENTS

INTRODUCTION ii

CHAPTER 1. AVIATION IN PREREVOLUTIONARY RUSSIA 1

The Birth of Aeronautics and Aviation 1
Russian Military Aviation in the Years of the First World War 7

CHAPTER 2. SOVIET AVIATION DURING THE YEARS OF THE CIVIL WAR AND THE FOREIGN MILITARY INTERVENTION 1918-1920 17

The Creation of Soviet Aviation 17
Aviation in the Battles for Soviet Power 23

CHAPTER 3. SOVIET AVIATION DURING THE PERIOD OF THE BUILDING OF SOCIALISM (1921-1941) 44

In Accordance with Lenin's Behests 44
During the Years of the Pre-War Five Year Plan 50
In the Defense of Our Aerial Borders 56
The Eve of the Second World War 63

CHAPTER 4. SOVIET AVIATION DURING THE SECOND WORLD WAR 1941-1945 . . . 75

Early in the War 75
Defensive Engagements 84
Aerial Encounters over the Capitol 90
The Enemy's First Major Defeat 96
Between the Volga and the Don 105
The Aerial Blockade 115
In the Sky Over the Kuban' 124
At the Kursk Bulge 135
Over the Dnepr 146
During the Winter Offensive 151
Under the Wings of the Vilsa and the Balkans 165
To Berlin! 180
In the Far East 197
Results of the Military Activities of Soviet Aviation during World War II 199

CHAPTER 5. SOVIET AVIATION IN THE POST-WAR PERIOD 207

Jet Aircraft 207
Under New Conditions 217
On Guard at our Homeland's Air Frontiers 223

CHAPTER 6. NAVAL AVIATION 232

The Establishment of Soviet Naval Aviation 232
Into a Difficult Time 239
Into a Period of Fundamental Change 253

Even odd

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Air Advances Over the Sea 260
Aviation of the Military Naval Fleet in the Post-War Years. 269

CHAPTER 7. AVIATION SCIENCE AND TECHNOLOGY AND MILITARY THEORY 275

The Development of Aviation Science and Technology. 275
The Birth and Development of the Operational Arts and the Military Air Force and the Tactical Types of Aviation Before the Second World War. 292
Operational Art of Military Air Forces and the Tactics of Types of Aviation in the Second World War 302
Operational Arts of the Military Air Forces and Tactics of Various Types of Aviation in the Post-War Years. 311

CHAPTER 8. THE BIRTH AND DEVELOPMENT OF ASTRONAUTICS IN THE USSR . . . 318

The First Military Rockets in Russia and the Development of Scientific Foundations for Astronautics. 320
The Development of Rocket Technology in the USSR. 329
Artificial Earth Satellites and Flights to the Moon 339
Flights of Cosmic Vessels 349

CHAPTER 9. THE CIVILIAN AIR FLEET. 368

Founding of the Civilian Air Fleet. 368
New Air Routes. 373
In the War Years. 381
Civil Aviation in the Post-War Period 389

CHAPTER 10. SOVIET SPORT AVIATION. 402

First Aviation Sportsmen. 402
Sport Aviation in the USSR Before the Second World War. 406
Everything for the Front, Everything for Victory. 415
Once Again in the Peaceful Sky. 423

CONCLUSION. 441

APPENDIX:

1. Aviators -- Heroes of the Soviet Union 449
2. Aviators -- Bearers of the Order of Glory First Step 619
3. Important Dates in the History of Aviation and Cosmonautics. 623

REFERENCES. 635

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INTRODUCTION

The Great October Socialist Revolution indicated a new path in the development of human society. In our country basic transformations took place which affected all aspects of the material and spiritual life of the people. /3*

The Tsarist regime restricted the people's artistic forces, and hindered the development of the economy. Only the transfer of power into the hands of the workers in October of 1917 opened wide the broad possibilities of rapid progress in all branches of industry, agriculture, science and culture.

In the 50 years from 1917 to 1967, the USSR achieved stupendous successes. We built socialism. The Soviet people moved foreward with a firm step along the path to communism. The powerful Air Force of the Soviet Union has been created on the basis of the rapid development of the socialist economy. Our homeland can justly pride itself for the remarkable achievements in the areas of conquering air and space. In an unprecedented short time, the USSR became a great aviation power, leaving behind it the most powerful capitalist countries.

All the Soviet people made a contribution in the creation and development of the Air Force. The Communist Party and the Soviet government constantly implemented the control of the work of the aircraft industry, the construction and all activities of units and agencies of the Air Force, the application of aviation in the national economy, and the development of air sports.

The creation of the Soviet Air Force was directly tied to the name of V. I. Lenin. Vladimir Ilich foresaw with remarkable insight that aviation was to have a great future. Under the most difficult conditions of the foreign military intervention and the Civil War, he found it possible to devote much of his attention to the building of the Red Air Force, the development of the aircraft industry, and questions of preparing aviation cadres, and the organization of the combat activities of aviation branches.

The great leader advised us to strengthen the defensive power of the Soviet State. He emphasized the necessity of the broadest possible application of scientific and technical achievements for the requirements of national defense. Vladimir Ilich demanded "the solution of a problem of combining the enthusiasm and the new revolutionary creativity of the oppressed with the use of the reserves from the bourgeois science and technology of militarism... without which he (the proletariat -- Editor's note) cannot master modern technology and the modern means of waging war" [1]. /4

In fulfilling the advice of Lenin, our Party ~~constantly~~ paid note to the creation of a powerful air force intended for guarding our homeland and fulfilling various tasks in the national economy.

*Numbers in the margin indicate pagination in the foreign text.

The military and civil aviation of the USSR was built on the basis of the progressive Soviet science. In both theory and practice, Russian scientists, inventors, and fliers solved the most important problems of controlled flight in air and space. Their works were made full use of in the design of various aircraft, and in developing the means of using them most advantageously.

In addition to this, the Soviet Air Force was developed not from the aspect of general progress in the field of science and technology. Our scientists, in traveling new roads in aviation theory, carefully kept track of scientific discoveries and, in a number of cases, used foreign experience in building the Air Force.

The Soviet government found itself heir to an extremely meager material basis for aviation left by Tsarist Russia. The country was backward economically. There were few aircraft, and equally few pilots. In spite of this, in record time we created a first-class aircraft industry, prepared our flight crews, nourished our talented scientists and designers, and built airfields. It was in achieving this that all the advantages of the Soviet social and government structure and the progressive character of the socialist system of national economy became apparent.

During the years of the first Five-Year Plan, the wings of the Soviet Air Force were strengthened. Aircraft bearing the red stars confidently flew to high altitudes and achieved long-distance flights. The Party educated thousands of fliers who were boundlessly devoted to their homeland. Their successes in conquering this fifth ocean were greeted (4) with rejoicing by all the workers of our country. The people loved their aviation and did everything to make it grow still stronger.

In response to the Party's concern over the love of the Soviet people, the aviators, sparing neither their efforts nor their very lives themselves, strengthened the defenses of the homeland, and tirelessly prepared themselves to defend the peaceful work of the people, and sharply strike down the enemy both on land and in the air. /5

During the Great Patriotic War, the Soviet Air Force dealt crushing blows against the enemy. In their stubborn struggles they achieved air supremacy and cleared the skies of the homeland of Nazi aircraft. Outside Moscow, on the banks of the Don and the Volga, at Kursk, in the far north and in the Crimea, at Warsaw, Budapest, Vienna and Berlin, and in the Far East -- everywhere our Air Force's combat activity was crowned with remarkable victories over a powerful and insidious enemy.

Many legendary feats were achieved by the aviators defending the Soviet homeland. Their heroism and military skill were valued at their true worth by the homeland which, through high decorations, paid honor to the courage and valor of the defenders of the Soviet skies. In 1934 our fliers were first awarded the title Hero of the Soviet Union. In 1939 the brave aviators were first given the honor of twice receiving this high award. During the Second World War, from a total of 106 fighting men who received the title Hero of the Soviet Union twice, 65 were fliers, and A. I. Pokryshkin and I. N. Kozhedub

were awarded this honor three times.

With the onset of peaceful days, the heretofore aviators along with fighting men from other branches of the Armed Forces stood in the first ranks of the defenders of the homeland. We constantly keep in mind that the imperialists threaten us with a new war. Our Air Force is the trusty shield of the Soviet sky. The Soviet Air Force, armed with formidable rocket-carrying supersonic aircraft, is capable of dealing powerful blows against an aggressor when necessary. Military aviation is served by men who are remarkable masters of their craft, first-class specialists who are extremely competent in such complex military technology. They are prepared, as had been their fathers and older brothers, to proudly fulfill their debt to their beloved fatherland.

Each passing year is witness to the expanding role played in the national economy of our country by the Civil Air Fleet, which is based on the newest, technically most advanced airplanes and helicopters.

The Aeroflot network has extended to the most distant points. Jet liners are rapidly carrying passengers, mail, and various cargoes, hundreds and thousands of kilometers. Our aircraft can be seen on many international airways.

The dimensions of our sports aviation activities are expanding. In the DOSAAF (All-Union Volunteer Society for Cooperation with the Army, Air Force and Navy) air clubs, tens of thousands of our young men and women are learning aviation specialties and sharpening their skills. In the field of sports aviation, our country certainly occupies a leading position world-wide.

Piloted aviation has proven to be the cradle of astronautics. Man's moving out into space was prepared for by the entire development of aviation science and technology. The world's first flight beyond the limits of the earth's atmosphere was accomplished by a Soviet citizen, the Air Force officer and pilot Yu. A. Gagarin. After him, more and more cosmonauts were launched into flight. Their achievements are an example of service to the homeland, and all the peoples of the planet were impressed by them. /6

It will not be long until the day when interplanetary spacecraft and interstellar space flights will carry Soviet men and women to new worlds. The most daring dreams will, in our day, very rapidly become reality.

In the past 50 years, Soviet aviation and astronautics has traveled a glorious path. Aviation technology was rapidly perfected: from the first clumsy silent aircraft to the swift aircraft which have overtaken sound, and spacecraft.

And how the people have grown! In the Air Force, the Civil Air Fleet, and the DOSAAF air clubs, highly qualified aviation specialists are working for their homeland without hesitation. And they bear any burden. They are fully prepared for the proficient use of even the most complicated machinery, of which the creators themselves are also talented Soviet aircraft designers.

Aviation and astronautics have before them a great future. This future is in our hands. Under the guidance of the Communist Party, the Soviet people will achieve new successes in flights in both the near-earth planned outer space.

This present work is dedicated to the heroic achievements of Soviet aviators. It is in these achievements that we find the basic evidence of the glorious progress of our Air Force. This book introduces the men who created the air- and spacecraft, the fliers who have brought glory to the Soviet Union both in days of peace and war, the cosmonauts who have achieved unparalleled flights far beyond the limits of the earth's atmosphere, specialists in various fields of work who made their contribution toward the development of aviation and astronautics. And it is hoped that the reader will pay note to the achievements which have charted this new ocean and who have laid a path into space; let his heart fill with pride for our beloved homeland and her glorious air force.

This work presented to the reader was written by a group of authors.

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CHAPTER 1.

AVIATION IN PREREVOLUTIONARY RUSSIA

ABSTRACT. This chapter describes the accomplishment of aviators in Russia before the revolution. The work of the Russian commission on aeronautics in military applications, formed in 1869, is described. The world's first aircraft, designed by A. F. Mozhayskiy in 1881, is shown. Applications of aviation in the first world war are described.

Cover Page Source

The Birth of Aeronautics and Aviation /8

In the struggle for the conquest of air, great credit must be given to the Russian people. With creative daring, they opened new paths in science and in the art of flying. The names of the great scientists M. V. Lomonosov, D. I. Mendelev, N. Ye. Zhukovskiy, K. E. Tsiolkovskiy, the creator of the world's first aircraft A. F. Mozhayskiy, the flier and innovator P. N. Nesterov, and many others have become part of world history with respect to the birth and development of the Soviet air fleet.

The initial steps on the path toward the conquering of air were made by the aeronauts. The first attempts at flight in a lighter-than-air balloon in Russia, as is evidenced by manuscripts, go back to 1731. In the 19th Century, aeronautics had already progressed beyond the stage of tests and had a practical base. In many countries of the world, persistent tests were being carried out to establish the application of balloons both in transport and military objectives.

In 1869, a Commission was organized in Russia on the application of aeronautics in military applications. The results of this activity was the creation of the first types of military aerostats and the training of aeronauts. Tests were also run on aerial observation, telegraph communication between aerostats and the ground, and route marches of aeronauts and aerostats in the air. Questions of the construction and application of balloons were to a great extent dealt with by the outstanding scientist D. I. Mendelev.

The first successes in the military tests of aerostats determined the future direction of work in the field of aeronautics. In Saint Petersburg in 1885, the first separate military unit was formed -- the Cadre of Military Aeronauts -- headed by Lieutenant A. M. Kovan'ko, an enthusiastic supporter of

military aeronautics. This unit took part in all major military maneuvers, during which the aeronauts took aerial observations, corrected artillery fire, and plotted graphs of the terrain. The positive outcome of the aeronauts' work was a major influence in the creation of new military units for aerial observation. In 1890, the Cadre of Military Aeronauts was sent to the Aeronautics Training Park, which had become the training and scientific test center for military aeronautics and the base for the formation of new units.

/9

PRIVILEGE

issued by the Department of Trade and Manufacture in 1881 to Naval Captain Alexander Mozhayskiy, for his projectile for air flight.

Naval Captain Alexander Mozhayskiy, resident of the city of Saint Petersburg, on 4 June 1880, made application at the Department of Trade and Manufacture for a five-year privilege for his projectile for air flight.

Cover Page Source

Description:

The projectile for air flight described below and illustrated in the diagram consists of the following major sections: wings, the vessel located between them, the tail, the carriage with wheels upon which the entire projectile rests, motors for rotating the screws, and a mast to which the wings are secured. The projectile wings are immobile. The tail consists of planes: horizontal and vertical; the first can be raised and lowered and is intended to guide the projectile up and down, while the second moves to the right and left and permits the projectile to turn to the side. The vessel serves for housing the motors, the materials for them, the load and the crew. The carriage with wheels, on which the entire projectile rests and is securely attached, serves for running the projectile along the ground before it ascends; while in the air, this same carriage serves as a balance for plumb. During the progressive movement in the air, the screws of the flying projectile are rotated by the motor, and as a result of air resistance, set the projectile into motion. In the graphic representation, Figure 1 diagrams the described projectile in plan, Figure 2 shows a side view, and Figure 3 shows a rear view.

Privilege issued by the Department of Trade and Manufacture in 1881 to A. F. Mozhayskiy for the construction of an aircraft.

In the Russian-Japanese War of 1904-1905, the knowledge and experience of the military aeronauts was first subjected to combat tests. The command of the ground forces rapidly recognized the practical value of aerial reconnaissance from balloons. Therefore, during the war first an aeronaut company, and then three aeronaut battalions were formed and sent to Manchuria. Offering aid to the ground forces, the free balloonists systematically carried out aerial reconnaissance with the use of photography, and corrected artillery fire.

/10

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Model of the World's First Aircraft, by A. F. Mozhayskiy.

The experience gained during the Russian-Japanese War presented the War Ministry with the necessity of forming new units of both moored and controlled aerostats (dirigibles). The first Russian dirigibles, the Krechet (the gyr-falcon) and the Albatross became part of the army's armament in 1910. In subsequent years several more dirigibles were built. By the beginning of the First World War, the Russian Army had four balloon companies with dirigibles, seven reinforced balloon companies, and one reinforced balloon detachment [2]. /11 The equipment for these units consisted of 15 dirigibles and 46 moored balloons. The balloon units were under the Head Military Engineering Command.

Aeronautics was the precursor of aviation. Studies in the field of aeronautics made possible the creation of heavier-than-air aircraft. From the ranks of the aeronauts, too, came the first Russian fliers.

Attempted flights on heavier-than-air aircraft were carried out at the end of the 19th Century. The theoretical basis for the creation of the first aircraft of this type was the ingenious discovery by M. V. Lomonosov, verified through tests, of the existence of a lifting force when a plane object moves through the air.

The world's first aircraft was built in 1882 by the renowned Russian scientist and innovator A. F. Mozhayskiy. To achieve his idea -- to create a heavier-than-air aircraft, Mozhayskiy invested approximately 25 years of diligent work. For a long time he studied the gliding flight of birds and worked with flying models and kites. Mozhayskiy repeatedly took to the air in a kite-glider of his own construction.

His work on constructing an aircraft was complicated by insufficient funds and opposition by Tsarist bureaucrats. However, having overcome all these difficulties, the brilliant inventor succeeded in finishing construction of his aircraft by mid-1882 and put it to test. During one of the tests, the world's first aircraft took off from the ground.

Mozhayskiy's flight vehicle had all the basic parts of the airplane: wings,

fuselage, engines, controls, and landing gear. However, the Tsarist government would not allocate funds for the further improvement of the first airplane, and the brilliant inventor Mozhayskiy gained no recognition during his lifetime.

Following on Mozhayskiy's heels, a large number of enthusiasts worked on creating aircraft not only in our country, but abroad as well. in France, the USA, Rumania, England, and other countries. The use, on aircraft, of internal-combustion engines, which are lighter in weight than the steam engine, made it possible to create more advanced aircraft. In 1903, the Wright Brothers, self-taught American mechanics, completed several test flights 3-5 minutes each in duration, on an aeroplane of their own construction. Their flights gained wide renown. People of the most varied professions became captivated by aviation.

A. F. Mozhayskiy's ideas and practical achievements, as well as the discoveries of scientists in the fields of aerodynamics and flight theory, proved themselves to be a favorable basis for the broad development of aviation design in Russia. Between the first and second decade of the 20th Century, many talented inventors and designers such as Ya. M. Gakkel', S. V. Grizodubov, A. V. Shiukov, A. A. Porokhovshchikov, D. P. Grigorovich, V. A. Slesarev, I. I. Sikorsky and others designed aircraft every bit as good as foreign models. /12

Soviet Aerospace

The impressive achievements of Soviet aircraft design resulted, in 1913, in the creation of the heavy, multi-engined aircraft Russkiyvityaz' (Russian Champion) and the Ilya Muromets. The giant Ilya Muromets, the world's largest four-engined aircraft, was for a long period the pride of Russian aviation. No where else in the world were there aircraft to compare with the Ilya Muromets with respect to mechanical and flying characteristics. It could carry a load of 1,500 to 1,700 kg, it could achieve flights lasting as long as five hours at altitudes higher than 3,000 meters and at speeds of 100 kph, and was armed with five or six machine guns.

For many years, D. P. Grigorovich's M-5 flying boat, built in 1914, was the best in the world.

In spite of the fact that Russian designers created test models of aircraft having high mechanical and flying characteristics, the Tsarist government gave preference to foreign models. This is explained by the general economic and technical backwardness of Russia, her dependence on foreign capital, and the worship of the ruling classes of all foreigners.

In filling the orders for the military departments, the aircraft factories (the First Russian Fellowship of Aeronautics (S. S. Shchetinin), the "Duks" joint-stock company, the Aeronautics Joint-Stock Company (V. A. Lebedev), the Russian-Baltic, etc., by 1910-1913 had turned to the production of aircraft primarily of French design (the Nieuport-4, the Farman-16 and the Farman-22). Exceptions were the Ilya Muromets and the M-5 flying boat, which were built in series and were used in the armament of the Russian army.

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The first Russian aviators were the sports fliers N. Ye. Popov, M. N. Yefimov, S. I. Utochkin, et al. Starting with 1910, the training of military

fliers was organized. At the Officers' Aeronautics School, an aviation unit was created, which in turn was reorganized into the Gatchinskiy Aviation School. In 1910, work began on the Sebastopol Aviation School. However, these schools did not satisfy the army's requirements for trained fliers, and this hindered the staffing of aviation squadrons.

Initially, the military aviation dipped into the personnel of pre-aeronautics, and therefore the aviation squadrons were created from aeronautics units. The decision to form the first six aviation squadrons was taken in September of 1911, on 14 November 1911, the Headquarters of the Irkutsk Military Okrug (a district) was the first to report that at the Fourth Aeronautics Company, quartered at Chita, an aviation squadron had been formed [3]. In the period from September 1911 through May 1913, a total of 18 aviation squadrons were organized, each with a six-aircraft staff [4]. /13

In these aviation squadrons, systematic combat training was put into practice. Initially it consisted basically of routine airfield daytime training flights in good weather. After 1913, night-time test flights also were carried out. In the summer, flights away from the airfields were practiced broadly, and exercises in reconnaissance were carried out, and occasionally landings and takeoffs were performed on unfamiliar terrain.

The crews of the Eleventh Corps Aviation Squadron, under the command of the outstanding Russian flier P. N. Nesterov, achieved great success in their combat training. Nesterov's activity in the field of military aviation was ~~short, but extremely multifaceted and fruitful. He worked a good deal~~ on increasing the maneuverability of the airplane, and he transformed it into a fearful weapon in aerial combat. This flier and innovator was the first to perform steep banks and spirals, and in so doing he discovered the phenomenon of the shifting of control function. Convinced of the fact that it was possible to make sharp turns in an airplane, Nesterov carried out a series of special tests and calculations and came to the firm conclusion that it was possible to carry out a closed figure in the vertical plane in an aircraft. On 27 August 1913 (9 September by the present calendar -- Tr. note) this brave flier, in a Nieuport-4, confidently performed a "loop", henceforth called the Nesterov loop. With this achievement, Nesterov laid the ground work for advanced aerobatics. In experimenting, he proved that the airplane, which has natural stability, can when handled properly come out of any position into normal flight.

P. N. Nesterov considered the application of acrobatic maneuvers a necessary condition for successful aerial combat. In his opinion, any flier who during wartime did not wish to "play the role of a hen or a peaceful dove" should have to be made to practice banks and flips, rolls and loops.

Nesterov attempted in every way possible to expand the limits of the military application of aviation. Under his direction, squadron fliers developed the means to use aircraft for target indicating and correcting artillery fire, and started night flights sooner than anyone else. In August of 1913, the squadron, with its commander at its head, performed the first group flight along the route Kiev - Oster - Nezhin - Kiev, during which the /14

fliers were trained in flight formation, direction findings from the maps, and a selection of landing spot points. Nesterov himself performed long-distance flights which were outstanding for that time: Kiev - Odessa - Sebastopol, Kiev, Saint Petersburg, Moscow - Saint Petersburg.

Starting in 1911, great attention was given to the yearly participation of aviation squadrons in military maneuvers. During these, possibilities and means of military activity of aviation were given practical tests.

Most instructive was the application of aircraft during troop maneuvers in the Warsaw military okrug in the summer of 1911. The northern and southern groups of troops, which were on maneuvers, were each joined by a single aviation squadron of flight instructors from the Sebastopol and Gatchina aviation schools. The flight crews underwent special training in flights beyond the airfields, and in carrying out aerial reconnaissance. At the Sebastopol Aviation School, brief guidance data had been developed for beginners, troops, fliers and intermediates who were participating in the 1911 maneuvers; these data on the handling of aircraft [5] were in essence the first instruction in the military application of aviation.

During the maneuvers, the aviators fully proved themselves in carrying out the problems in aerial reconnaissance and communication, and obtained a high evaluation by their commanders.

In the autumn of 1913, the Eleventh Corps Aviation Squadron successfully took part in the maneuvers of troops from the Kiev military okrug. The squadron personnel acquired great experience in aerial reconnaissance, the rapid delivery of dispatches, the selection of sealed airdromes, the organization of changing supply bases, etc.

The Russian pilots obtained their baptism of fire in the Balkan War of 1912-1913. A squadron of volunteer fliers (T. N. Yefimov, B. S. Maslennikov, N. D. Kostin, et al.) took part on the side of the Bulgarians. The Russian fliers performed aerial reconnaissance, bombarded fortifications of the Turkish troops, distributed pamphlets, and fulfilled tasks in communications. In the battles at Adrianopol, they successfully achieved aerial photography of enemy positions. This positive experience in the application of aircraft both during maneuvers and in the Balkan War served as a basis for the further development of Russian military aviation.

By the end of the First World War, Russia had 39 aviation squadrons, of which 30 were only Corps level, eight were reinforcements, and one was in the field (army). These aviation squadrons numbered 200 fliers. [6] Short supply numbered 90 men. To service these aviation squadrons, six aviation companies were formed. Each of them serviced four to seven aviation squadrons. There were a total of 263 aircraft at the command of the military department.[7] /15

In the spring of 1913, aviation sub-units were formed from the subordinates of the aeronautics branch. However, aviation was still not an autonomous branch of arms. It was part of the engineering forces, and was considered as one of the technical means of reconnaissance and communications.

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Russian Military Aviation in the Years of the First World War

The lack of development of the aviation industry and calculations for obtaining the basic aircraft and engines from allies set Russian aviation back in the first year of the war and put it in a difficult position The demands by the front for aircraft increased substantially, but it was impossible to satisfy them. The production capability of Russian aircraft factories was low: there were neither enough essential basic materials nor qualified workers.

However, Russia's allies themselves were suffering from a lack of aircraft, and habitually curtailed delivery of aircraft and engines. Furthermore, the aircraft turned over to Russia by the allies were, as a rule, of obsolete construction and had been withdrawn from their armament. There were even cases when England and France sent Russia aircraft and engines which had already been made use of.

Thus, the calculations by the Tsarist government to arm our front-line forces with foreign aircraft proved unsound. Throughout the First World War, the Russian army obtained a total of only 3,150 aircraft, of which 2,250 were built within the country and around 900 had been brought in from abroad.

At the very beginning of the war in February of 1917, 46 aviation squadrons were formed [8]. However, the squadrons received their aircraft only with great irregularity.

Russian aviation experienced an especially great need with respect to aviation engines. There were cases when, at the height of military actions, substantial numbers of aircraft were built in Russian factories and sent to the front without engines. Sometimes, for a total of five or six aircraft there were two engines in good repair. This makes it easy to see what a tremendous stress there was on the Russian aviators to carry out their combat missions on obsolete, worn-out variegated (more than 25 types[1]) aircraft. /16

There was also a constant short supply of flight crews. In addition to the Sebastopol and Gatchina aviation schools, starting in 1915 the civil aviation schools in Petrograd, Moscow and Odessa began training combat fliers. In 1915, all these schools trained 233 fliers, and in 1916 they trained 497 [9]. In 1916, a school for aerial observers was opened in Kiev, and during the course of the year 173 men were trained there [10].

The development of aviation and its substantial losses during the war made clear the necessity to admit into the flight schools volunteers from the lower classes. However, initially only officers were permitted to train for the specialty of aerial observer. It is true that this was explained by the fact that aerial observers had to have strong military and special training in order to fulfill their intelligence tasks, drop the bombs on target, fire machine guns at both aerial and ground targets, and be able to handle the radio and photographic equipment.

[1] Nieuport-4, -10, -11, -17, -21, -24; Farman-16, -22, -27, -30; Moran; Voisin; the Ilya Muromets; the M-5 and M-9 Flying Boats; the Lebed-12; the Anatra; the Moskva; the Caudron; the Duperdussen; the Sopwith, etc.

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The war made it necessary to modernize the organization of structure of aviation. In 1916, at the War Ministry there was created an Air Force command, which basically handled questions of material and technical support of aviation. However, control of the Air Force for the ready army was put in the hand of the field general-inspector through the inspectors of front-line aviation. In the army, all aviation squadrons were combined into a division, whose commander coordinated and controlled the efforts of all the aviation toward solving problems confronting the army.

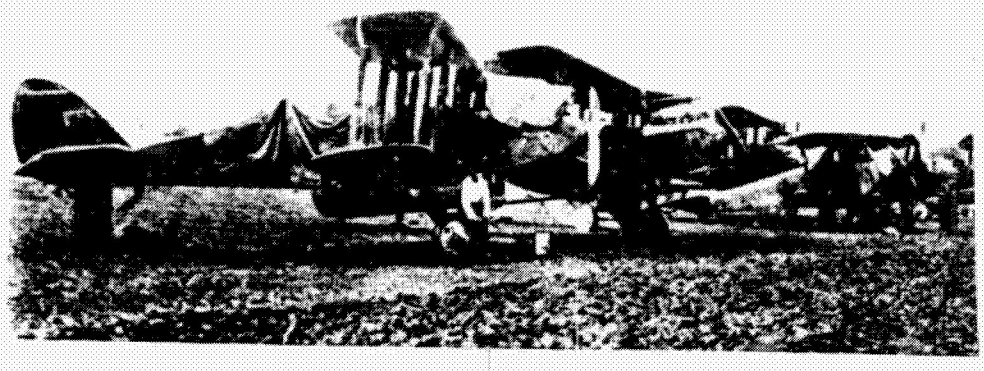
From the first days of the war, Russian aviation took an active part at the front. For this reason, the area of the combat application of aviation constantly expanded. Aviation squadrons fulfilled tasks of aerial reconnaissance, bombing troops in the field of battle and behind-the-line objectives, engaged in combat with enemy aircraft, etc.

One of the basic tasks of aviation throughout the war was reconnaissance. As a rule, aerial observers determined enemy troops concentration points and paths of movement, thereby helping the command to accurately estimate the situation and make well-founded decisions. Most frequently, observation was performed visually, although the most important objects were also photographed. /17

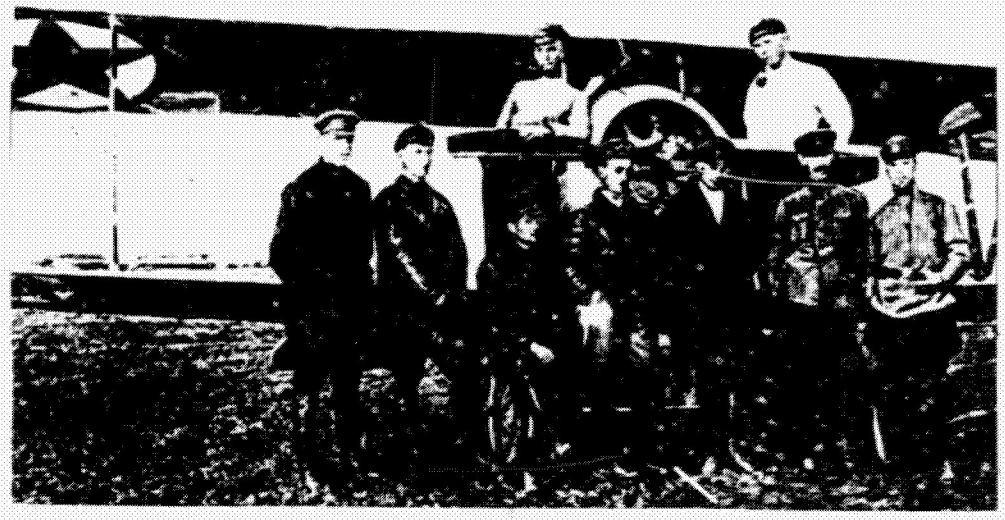
A. F. Mozhayskiy

A Group of Fliers from the Ilya Muromets Squadron

P. N. Nesterov



Aviation Squadron of the First Horse Army at the South-West Front. 1920.



Pilots and Engine Mechanics of the Third Aviation Squadron of the First Fighter Aviation Division on the Southern Front. 1919.

Thus, during the East Prussian operation in August of 1914, fliers from the aviation squadrons of the Second Russian Army gave the command advance notification of the build-up of enemy troops and the impending threat of a counter-offensive along the army's weakly reinforced flanks. However, the Army Military Command was doubtful of the data given by aerial reconnaissance, which was one of the causes for the heavy losses of Russian troops in East Prussia.

Aerial reconnaissance was successfully carried out by the Third and Eighth Armies on the southwest front during the Galicia operations (August of 1914). Reliable evidence of the enemy supplied by fliers helped the command to correctly determine the direction of strikes against the enemy. During this operation, only two aviation squadrons of the Third Army (Ninth and Eleventh Corps) carried out more than 70 sorties for reconnaissance purposes.

Ye. K. Kruten' with an Enemy Aircraft Which he Shot Down.

Very frequently, the fliers helped reveal enemy intentions. Thus, aerial observers of the Third Russian Army succeeded in forewarning the command of the German preparations for breaking through the Russian front in the region of Gorlitz in 1915. This is witnessed by one of the headquarters documents from the Third Army dated 27 June 1915, which reads, partially: "...on the basis of observations carried out by Second Lieutenant Legat (Eleventh Aviation Squadron)... which observed heavy concentrations of enemy forces on the Penzhkowicz and Galicia front, measures... were taken... These measures made it possible for the Tenth Corps to contain overwhelming enemy troops for three days and to forestall a full break through at the Army's center" [11].

As early as the first days of the war, along with visual observations Russian pilots began making use of photo reconnaissance. Thus, aerial photography was used during the siege of the Peremyshl fortress by Russian troops in the autumn of 1914. In addition, this was the first instance of photographic evaluation of the effectiveness of artillery fire. From 1915 on, in conjunction with the switch to position warfare, the volume of aerial photo reconnaissance increased.

There was especially great activity by Russian reconnaissance aircraft during preparations and the launching of the troop offensive on the southwest front in the summer of 1916. Aviation squadrons systematically carried out reconnaissance of the enemy's defenses through the use of aerial photography, which made it possible to gather the most detailed and accurate data on the spread of the Austrian troops and fortifications as well as on the system of fire, and these reconnaissance data in turn made possible the successful offensive of Russian troops.

This is what one commander from the Eleventh Army wrote in an order dated 20 June 1916: /18

"Before the beginning of our glorious offensive, aviation squadrons which made up part of the Army entrusted to me carried out a great number of brave aerial reconnaissance missions using aerial photography...

"...The entire enemy region was fully photographed, thanks to which Army headquarters obtained the most detailed and precise data on the entire fortified enemy position erected before the Eleventh Army..." [12]

During the aerial reconnaissance carried out by Russian fliers, they frequently had to fight off attacks by German fighters and avoid antiaircraft

battery fire. In so doing, the fliers frequently showed their exceptional courage and heroism. Thus, on 17 May 1916 the commander of the Twenty Fourth Aviation Squadron, Lieutenant N. A. Mul'kov, along with his observer ensign M. A. Yakovlev, flew a reconnaissance sortie, and in the region of Stvolovitsa encountered a German Albatross and engaged him in battle. Before the eyes of our infantry, the Russian fliers downed the enemy aircraft [13]. Junior Captain F. S. Rodin, a flier with the Twenty Ninth Aviation Squadron, along with his observer Lieutenant Senatorskiy, successfully performed reconnaissance of enemy positions under heavy fire from their batteries in October of 1915. Upon /19
his return from his mission, 68 bullet holes were found in his aircraft [14].

Russian Fliers Report to Their Commanders the Results of Their Aerial Reconnaissance.

Along with aerial reconnaissance, the aviation also performed bombing overflights. It is worth pointing out the military action of the world's first large unit of heavy bombers -- the squadron of the airships Ilya Muromets. This squadron, created in December of 1914, had by February of 1915 already engaged in combat action. The heavy bombers were intended for destroying enemy field fortifications and railroad installations, so as to drain the enemy's reserves, aircraft at the airdromes, etc. The Muromets aircraft performed night and day missions, both singly and in groups, frequently repulsing attack by enemy fighters. During these combat actions, the squadron pilots and observers (A. V. Pankrat'yev, G. V. Alekhnovich, A. N. Zhuravchenko, et al.) succeeded in developing a system of bombing and rifle armament for the Muromets aircraft, determining the principles of target bombing, and individual elements of tactics in bomber aviation.

By autumn of 1916, the squadron combat units, numbering 20 Muromets and 30 light aircraft, successfully took part in actions on the north, west and southwest fronts. They dealt sharp blows against German forces and successfully carried out long-range reconnaissance. Thus, on 11 April 1915, the crew of the aircraft Ilya Muromets completed a successful flight to the

Neudenberg station and dropped 12 bombs with a total weight of 200 kg. The station was heavily damaged.

In the second half of 1915, heavy squadron aircraft began performing group flights against large enemy military objectives. Especially effective were the Muromets flights in the autumn of that same year against the enemy supply dumps at Tauerkalne and Friedrichshoff.

In striving to increase their time of action against the enemy, in the summer of 1916 the squadron fliers began performing night combat sorties. Thus, the successful night strikes of the Muromets against the supply dumps and railroad stations at Mitthau are well known. On 15 June 1916 at zero hours 30 minutes, the Ilya Muromets-1 dropped 20 bombs with a total weight of 15 poods (540 lbs) on the station and dumps. "These successful drops caused damage and fires which could be seen from the aircraft throughout the time of our entire flight from Mitthau to Riga" [15].

The Muromets aircraft also waged a damaging war against enemy aircraft -- both at airfields and in the air. In August of 1916, these heavy ships performed a series of successful group flights against a base of German flying boats in the region of Lake Angern not far from Riga. On 23 August, despite withering fire by antiaircraft batteries and an aerial attack by eight flying boats which had risen to encounter them, a squadron consisting of four ships dropped 72 bombs with a total weight of 52 poods (1,872 lbs.) against hangars and flying boats prepared for launch. Twenty two hits against hangars and 11 against the piers were noted [16]. /20

Using rifle armament, the crews of the heavy ships successfully repulsed the attacks by the German fighters. There were cases when individual ships emerged victorious from single handed combat with several enemy fighters. Here is one well-known fact. On 12 September 1916, the crew of the Muromets engaged in battle with four German aircraft and downed three of them. Only upon their return to their own airfield was the defenseless ship (which had exhausted its ammunition) shot down [17].

In group dogfights with enemy aircraft, the crews of the heavy ships performed maneuvers within combat formation and maintained mutually defensive fire.

All in all, through its effective actions the squadrons of ships inflicted extensive damage against the enemy and made a significant blow against the morale of the enemy troops. The military command gave high praise of the combat actions of the Muromets fliers.

Bombing actions were also carried out by crews of Corps and Army aviation squadrons. Thus, on 15 June 1916 a successful flight against enemy dumps in the town of Baranovich included 10 aircraft of the Fourth Aviation Division under the command of Captain V. A. Jungmeister. They dropped a total of 55 bombs with an overall weight of 36 poods (1,296 lbs.), with the result that direct hits which resulted in fires were observed [18].

In addition to fulfilling missions of aerial reconnaissance and bombarding, as early as the beginning of the war the necessity had been manifested of engaging in actual aerial combat with enemy aircraft. Many front-line Russian fliers, especially P. N. Nesterov, actively sought ways and means for destroying the enemy in the air.

In the first months of the war, aircraft still had no rifle armament. P.N. Nesterov felt that with the lack of such armament on the aircraft, the most reliable means of combat against enemy aircraft was the pilot's ability to maneuver or strike blows which would force the enemy to make a landing, otherwise -- to act as a battering ram. In so doing, Nesterov made it possible /21
for both the ramming aircraft and the pilot himself to make a safe landing.

Nesterov soon decided to put his idea into practice.

On 26 August 1914 (8 September 1914 by the present calendar -- Tr. note) flying a Morane in the vicinity of the town of Cholkva (now called Nesterov), he overtook a two-seater Austrian Albatross and, after an unsuccessful attempt to force it to land through maneuvering, he assaulted it using his aircraft as a battering ram. What ensued was the world's first dogfight. The enemy observation airplane was downed, but this cost the life of the Russian pilot and hero.

Following in the footsteps of P. N. Nesterov, Russian front-line aviators throughout the war laid the basis for a combat application of fighter aircraft.

At first, the faster and more maneuverable observation planes, armed with machine guns, were used in the capacity of fighters. Then special aircraft more suited for carrying on aerial combat made their appearance.

In the Russian Army, the first fighter aviation squadrons were created in early 1915: one for protecting Warsaw from the air, and the other for the Tsarist General Headquarters. In the spring of 1916, 12 more fighter squadrons were formed, and one of these was assigned to the army in the field.

In the summer of 1916, in connection with the successful advance of Russian forces on the southwestern front and the threat of a full collapse of the Austro-Hungarian army, the Germans transferred to the east a large number of high-speed aircraft, primarily fighters. The situation in the air deteriorated substantially. The German aviation, superior in numbers, hindered the combat actions of Russian fliers on various parts of the front. This situation could be changed only by concentrating the efforts of Russian fighter aircraft in various directions.

With this object in mind, the decision was made to create front-line fighter aviation groups. Using these groups, the front-line command could effectively influence the situation in the air in any region. In August of 1916, a fighter aviation group was created on the southwest front. It included three squadrons with a good deal of combat experience against the enemy in the air. To complement the group in achieving well-timed interception of German aircraft, an aerial observation, warning and communication

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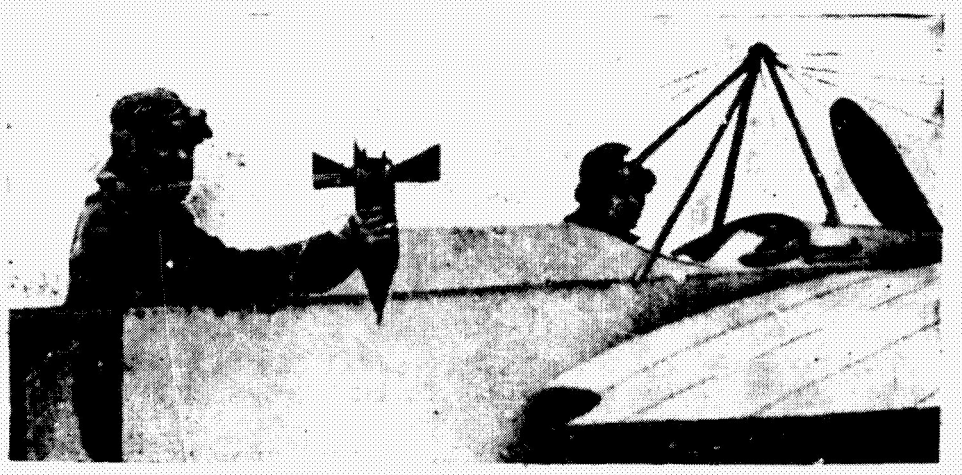
service was organized, as well as one to guide pilots to their targets with the aid of special signal panels and fire from antiaircraft guns.

The front-line fighter group began its combat action in the vicinity of the town of Lutsk. Through August-September of 1916 its pilots downed four /22
enemy aircraft and forced several others to land in aerial combat, as a result of which the German aviation curtailed active combat in the direction of Lutsk. With respect to this, the inspector of aviation for the southwest front noted: "The daring actions of our brave aviation groups have made certain that the enemy will not forget Lutsk" [19]. In the future, the southwestern front fighter group successfully continued its combat action. Thus, on 20 December 1916, eight aircraft from the group waged four aerial battles, in which two enemy aircraft were downed [20].



This is the Manner in Which Bombs were Dropped at Dawn of the Military Application of Aviation.

The experience in creating front-line fighter aviation groups in the Russian Army fully justified itself, and was later used by other warring nations.

An outstanding role in the creation of Russian fighter aviation was played by the combat pilot Ye. N. Kruten', a student and successor of P. N. Nesterov's. Early in the war, Kruten' engaged in battle at the front as a line pilot, and then commanded Army aviation squadrons, fighter squadrons, and fighter groups, respectively.

A shining master of aerial combat, Kruten' during the war gained over 15 victories. During his aerial encounters with the enemy he acted boldly and decisively. Once, in early August 1916, over the town of Nesvizh, a German Albatross appeared. Kruten', commander of the Second Fighter Aviation Squadron, immediately took off in his Nieuport and engaged the enemy. To everyone's view, the brave flier downed the enemy aircraft and made a forced landing not far from Nesvizh [21].

There were other fliers in Russian aviation who, like Nesterov and Kruten', /23

manifested their innovativeness in piloting and in the combat application of aircraft. Of great value for improving flying skills, primarily for fighter pilots, was the performance of the spin -- an aerobatic maneuver -- by K. K. Artseulov in 1916. Heretofore, the spin had world-wide been considered the skurge of aviation. As a rule, any airplane which accidentally slipped into a spin ended up by crashing. Having mastered this figure, Artseulov significantly broadened the maneuverability of the aircraft in aerial combat and decreased losses in aviation.

All in all, during the years of the First World War aviation made giant steps forward. From the simple auxiliary means of reconnaissance and communication which it had been when it entered the war, aviation grew into an independent branch of odds. By the final stages of the war, aviation had participated in all major operations and had proven itself a significant influence in the course of military actions. Along with the already existing reconnaissance aviation, new types of services were borne: bombing, fighter, and fire-control.

However, in prerevolutionary Russia there were severe restrictions on aviation's ability to develop. In its growth, it remained behind the aviation of the allies and enemies. By February of 1917, our aviation numbered a total of 1,039 aircraft, of which 590 [22] were in the active army serving 85 aviation squadrons [23], while at the same time French aviation by the end of the First World War (November 1918) had 3,321 aircraft, the English had 1,758 and the Germans had 2,710.

During the course of the First World War, aeronautics also received a certain amount of development along with aviation. However, it is true that Russian diregibles performed only a very few flights for reconnaissance or bombing. Having received substantial damage from antiaircraft fire and fighters, in the future they no longer were used in combat missions. However, moored aerostats became more widely used for observation behind this field of battle and correcting artillery fire. Their numbers grew.

In early 1917, the aeronaut companies were reorganized into squadrons which merged with the corps and armies. As a whole, the Russian Army had approximately 80 aeronautic squadrons [24].

Thus, by the end of the 19th and the first decade of the 20th centuries, the Russians had achieved major successes in the creation of aircraft. Our country can justly consider itself the birth place of aviation. Under the conditions of the technical and economic backwardness of Tsarist Russia and the distrust shown by the ruling classes for anything new and innovative, our people nevertheless brought forth a significant number of aviation enthusiasts. The Russian fliers successfully mastered aviation technology and made a proud contribution to the development of aerobatics and the bases of the military application of aviation. /24

During the years of the First World War Russian aviators, struggling against the trying conditions of the acute lack of material parts and constantly struggling to overcome stagnation and the bureaucratism of the command,

demonstrated great heroism, inventiveness and sharpness in carrying out combat missions. It was they who laid the foundations for the tactics of bombing, fighter and reconnaissance aviation. However, during the Tsarist regime any creative thought in any field, including aviation, could not obtain wide-spread development. Only the Great October Socialist Revolution, which heralded the beginning of a new era in the history of our homeland and in that of all mankind, opened the way for the rapid development of the Soviet Air Force.

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CHAPTER 2

SOVIET AVIATION DURING THE YEARS OF THE CIVIL WAR AND THE FOREIGN MILITARY INTERVENTION 1918-1920

ABSTRACT. The period covered by this chapter includes the birth of Soviet aviation per se. The aviation history of the Civil War in the foreign military intervention of 1918-1920 is described. Photographs of several famous pilots of the day are presented.

The Creation of Soviet Aviation

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Under the leadership of the Communist Party and its chief V. I. Lenin, in October of 1917 the revolutionary workers class, soldiers, sailors and working peasantry of Russia overthrew the rule of the capitalists and landowners, and set up the Soviet government.

The formation of a new socialist state caused wild anger and terrible hatred on the part of our enemies. All the dark forces of the decrepit old world rose up in arms against the Soviet Union: the deposed landowners and capitalists, Tsarist generals and officers, imperialist powers of fine governments, and their armies. Our Party was forced to pay close attention to the creation and strengthening of the Armed Forces, who were called upon to protect the great achievements of the proletariat revolution.

Simultaneously with the organization of a land army and navy, aviation was created. As early as the third day of the victory of the socialist revolution, upon command from V. I. Lenin at Petrograd, the first organ for commanding the Air Force was created -- the Bureau of Commissars of Aviation and Aeronautics, consisting of eight men. For its president they selected A.V. Mozhayev, who had participated in the First World War as a soldier and flier of one of the aviation squadrons of the Russian Army. In 1917 he had entered the Communist Party and had taken active participation in the Great October Socialist Revolution.

At the very first meeting of the Bureau, it was decided to put the UVVF (Administration of the Air Fleet) under the control of revolutionary headquarters, which were located in Smolnyy, to reelected commanders and soldier

committees in all the aviation units if they proved to be not on the side of the Soviet power, and to make known along the front the decisive support voiced in favor of the Soviet power by the personnel of all the aviation and aeronautic units. It was also decided to proceed with the formation of Red Guard aviation and aeronautics units depending upon men who were both reliable and devoted to the revolution, and who could be relied upon to take part in front-line battles without refusal; aviation units who maintained neutrality were disarmed and reorganized. The formation of the new aviation units was headed by the Bureau of Commissars [25]. /26

A. V. Mozhayev

On 29 October 1917[1] the Bureau proceeded with putting the newly made decisions into effect. In two and a half months six of the first socialist aviation squadrons were organized, with 12 aircraft each. Later aviation squadrons had a total of six aircraft each. These squadrons, as a rule, had been created on the basis of aviation units from the old Tsarist army. Thus, the First and Second Aviation Squadrons were formed on the basis of the Twelfth Army Aviation Squadron, whose personnel, after their return from the northern front, were one of the first to turn to the side of the Soviet power. The organizer and commander of the First Socialist Aviation Squadron was I. Ya. Ivanov. The Third Socialist Aviation Squadron was created on the basis of the former Kronstadt Aviation Squadron. Its personnel consisted of fliers and observers, engine mechanics, drivers, welders, joiners, and other specialists needed for servicing and repairing aircraft. The squadron numbered a total of 100 men.

A great role was played by both the military-revolutionary and soldiers' committees in the creation of Soviet aviation. Under the direction of the Party, they guided work in the knitting together of new aviation squadrons devoted to the Soviet government, and rallied around them flight and support personnel, directed the revolutionary affairs within the units, eliminated counter-revolutionary staff from them, and struggled to secure aircraft and materiel.

The first socialist aviation squadrons took active part in the defense of Petrograd against Kerenskiy and Krasnov's counter-revolutionary forces. They carried out aerial reconnaissance, strafed enemy troops, distributed propaganda literature, maintained communication with individual fortified areas, and bombarded the German landing force which had debarked in Finland. /27

On 30 December 1917, the First Socialist Aviation Squadron was ordered from Petrograd to the Ukraine, where it took part in battles against German

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1 All dates prior to 1 February 1918 are given according to the old calendar.

invaders and the supporters of Petlyura. Behind them, the Second Socialist Aviation Squadron under Mogilev arrived at the front.

One of the first organizational steps taken by the People's Commissariat on military and naval affairs was the creation of the All-Russian Board for Administering the Air Fleet at the Republic [26]. The Board consisted of ten men. Its president was K. V. Akashev, a professional revolutionary, and aviation engineer and flier.

On 11 December 1917, there was the first meeting of the Board, at which was selected the draft of the Board's Regulations for the Administration of the Air Fleet. This draft was supported by the People's Commissar for Military and Naval Affairs on 20 December.

The All-Russian Aviation Board was the organ of the joint administration of the Air Fleet. It carried out a great deal of work with respect to acquiring stores, organizing aviation units and sub-units, and the central and local administration of the Air Fleet. In addition, it dealt with problems of training aviation crews, organizing scientific and research work, and obtaining aviation stores and fuel.

On 25 January 1918, the People's Commissariat on Military and Naval Affairs was handed Order No. 84, by authority of which it was ordered to "maintain fully for the working people all aviation units and schools." In carrying out this order, the Board turned to all aviation workers with the appeal to protect all crews and stores in the interests of the revolution.

Thanks to the broad organizational work carried out by the All-Russian Aviation Board, trooptrains with aviation stores, fuel, and aircraft themselves starting arriving in Moscow, Tulu, Petrograd and other cities. During this time, the personnel of the aviation units frequently had to force a road for themselves with gun in hand into the center regions of the country.

The nascent military intervention and the increase in the number of aviation units by 1918 forced changes in the organizational structure of the control of the Red Air Fleet. On 24 May 1918, Order No. 385 of the People's Commissariat on Military and Naval Affairs created the Mean Directorate of the Workers' and Peasants' Red Air Fleet, to manage the aviation units. It was headed by a Council consisting of M. A. Solovov, a mechanical engineer and head of the Main Directorate, and two commissars. All basic functions previously fulfilled by the All-Union Aviation Board with respect to the management of the Air Fleet were turned over to the Council. Along with the Mean Directorate, Air Fleet District Directorates were created which handled problems of reorganizing the aviation squadrons from the old Army and forming new Soviet aviation squadrons. The All-Russian Aviation Board was abolished. /28

Several months later, at the Republic Revolutionary Military Council, a Field Directorate of the Red Air Fleet was created and received the abbreviated designation Aviadarm[1]. It directed the military activities of the aviation

[1] Aviadarm -- field army aviation.

units of the Soviet Air Fleet through the Field Directorate for aviation and aeronautics in the front and individual combined-arms armies. The head of the Field Directorate of the Red Air Fleet was A. V. Sergeyev. He was a soldier who had become flier. He entered the Communist Party in 1911 and actively took part in the Great October Socialist Revolution and the Civil War.

To increase the role of Party organizations and strengthen the Party influence over the personnel in the aviation squadrons, in August of 1918, upon orders from the Central Committee of the Revolutionary Communist Party, the Moscow Party Committee created the Party authorities in the Air Fleet. Hundreds of communists, including the best of the Party workers, were sent to the aviation units, schools and institutions.

The establishment of the Red Air Fleet took place under the most trying conditions. In those years, the aviation factories throughout the country were more like shops with respect to the assembly of various types of aircraft and engines from foreign companies. By October 1917, Russia had 18 active low-power aviation companies, of which 11 were aircraft assembly plants, five were engine assembly plants, and two were propeller assembly plants; all of them hired a total of around ten thousand workers and professional employees. Russia still had no technical basis for the development of an aviation industry. In addition, engineering personnel were also few in number.

The Civil War, which had begun, made it still more difficult to supply aviation units with aircraft, engines and spare parts. Several companies were /29
destroyed, while the larger ones, located in the south of the country at Odessa, Simferopol, Taganrog, Berdyansk and other cities, were captured by the White Guards. The primary task of supplying aviation technology lay on the shoulders of the Moscow aviation factories and the Duks and Gnone shops, and the factories in Petrograd -- the Russian-Baltic factory and those of Shchetinin and Lebedev. However, they too, in view of the insufficiencies in raw materials, fuel and provisions for the workers, could turn out only a small number of aircraft. Therefore, it was natural that with the creation of the first aircraft units, the short supply of aircraft, engines and various pieces of aircraft equipment [illegible] sorely felt.

Substantial losses were suffered by Soviet aviation as a result of the German advance which begin in February of 1918. The aviation units lost at that time approximately 500 aircraft, 150 trucks, 110,000 pounds of gasoline, and many other aviation stores [27].

Great difficulties also resulted in the military activity of the aviation units as a result of the fact that there were insufficient supplies of fuel and lubricating materials. This was explained by the fact that the primary oil sources had been occupied by the enemy. Therefore, aircraft had to make due with various substitutes for aviation fuel -- gasoline, alcohol mixtures, etc.

In September of 1918 the aviation groups and squadrons of the Red Air Fleet had a total of 266 working and 59 grounded aircraft. In addition, there were various types of machines and equipment of obsolete construction. Along

with this quantity, there were another 169 serviceable aircraft at the central aviation warehouses and parks [28].

The Communist Party and the Soviet government took energetic steps to supply the aviation units with aircraft, engines, fuel and lubricating materials.

In 1917-1918, on the basis of decrees from the Council of Peoples' Commissars of the RSFSR, several aircraft assembly and aircraft engine companies and repair shops were nationalized. With the object of achieving central control and coordination of the work of the various aviation industries, at the end of 1918 a special authority was created within the Supreme Soviet of the national economy -- the Glavkoavia (The Main Directorate for Combining Aviation Factories of BSNKh).

To organize the construction of heavy aircraft, in 1919 there was created /30
a special government commission on heavy aircraft, among whose members there were the outstanding scientists N. Ye. Zhukovskiy, B. N. Yur'yev, V. P. Vetchinkin, and fliers from the heavy aircraft squadrons.

Lenin closely followed the work at the aviation factories. He repeatedly met with workers from the Moscow aviation factory Duks and, in conference with them, took interest in the many problems of the company's activity and the life of the workers. Thus, after one of these meetings an order was sent out offering the aviation factory unlimited aid, and the Soviet government allocated the funds for increasing aircraft production.

Many decrees and directives issued throughout 1918 and 1919 by the Council on Labor and Defense directly affected the growth of the aviation industry, straightened out the work of its individual enterprises, and strengthened the material base for our Air Fleet.

In December of 1917, Lenin passed a resolution petitioning the Directorate of the Air Fleet to accelerate the dispatch of additional advances to the Anatra aircraft factory. In July of 1917 it gave authorization for an advance of 200,000 rubles to the Moscow Aeronautical Engineering Factory [29].

In the Central Party Archives of the Institute of Marxism-Leninism, there is maintained an interesting document signed by V. I. Lenin in which he allocates 47 million rubles for the construction of airfields in Saratov, Kirsanov and Pzhev [30].

In addition to this, the Communist Party and the Soviet government waged a relentless battle with those who sabotaged measures aimed at rebuilding the economy on a military footing and disrupt the strengthening of the Red Army and Red Air Fleet. Thus, a decree from the Council of People's Commissars of the RSFSR dated 12 January 1918 reads, in part:

"In view of the statement by the Board of Directors of the Andreyev-Lanskiy aircraft construction factory and K° concerning a desire not to

pay heed to the decree on demobilization and a desire to count on all the workers, the Council of People's Commissars has ordained the following: to confiscate said factory and all property therein, and to declare it the property of the Russian Republic. All technical and professional personnel must remain at their posts and fulfill their obligations. Anyone guilty of wilful negligence of his assigned duties or sabotage will be turned over to the Revolutionary Court" [31].

The Soviet government also took steps to secure aviation industries with qualified workers. On 17 November 1920, the Council of Labor and Defense took steps to mobilize specialists for work in aviation industries. /31

As a result of the steps taken, the Moscow and Petrograd shops and factories began to turn out aircraft and engines. During the years of the Civil War, the aircraft industries prepared 1,574 aircraft and 1,740 engines and made 669 aircraft and 270 engines.

Other sources for filling our aircraft pools were captured aircraft and engines. Thus, during the duration of Arkhangel'sk, 139 Sopwith, 44 Nieuport and 31 Farman aircraft and approximately 300 aircraft engines were captured.

Our Party devoted a good deal of attention to questions of training and supplying Soviet aviators, fitting out aviation units with reliable cadres who were dedicated to their homeland and the revolution, and organizing scientific research bases.

Especially acute was the lack of aircraft personnel. By late 1918, the makeup of the Red Air Fleet was 269 fliers and 59 observers. Many officers had gone over to the camps opened by the enemies of Soviet power. Several who had remained in the Soviet aviation squadrons carried subversive activites. The Party waged relentless war against the traitors and carried out a great deal of educational work among the flight personnel in the aviation units. It guided the aviators, who had come up from the working classes, in their chosen tasks for the revolution.

In order to fully resolve the problem of training aviation specialists, it was necessary to straighten out the training of our own Soviet flight personnel in our aviation schools.

In 1918, out of ten flight schools with which aviation was supplied, seven were in the camp of the White Guards. The basic burden of work in training fliers lay with the First Moscow Aviation School of the Workers and Peasant Red Air Fleet. During the tumultuous days of October 1917, the personnel from this school took an active part in the battle for Soviet power.

In November of 1918, Lenin visited the Moscow Aviation School and became intimately familiar with its composition, the life of the personnel, and the education of the students. The school's work encountered extremely difficult times. New spare supplies for aircraft were not available. The fliers' training was halted by breakdowns in the supply of fuel. At the school

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nutrition was disrupted for normal, there were no rations, and the personnel received their per diem only with great delay. The lack of supplies often made it necessary for flight instructors to fly provisions in from distant regions. /32

On the basis of the Lenin's decree, the school became strengthened by experienced communist leaders, and became fitted out with qualified flight instructors, and rations and supplies were made available for the personnel. [32]

In those years, great aid was also given toward training cadre in the Yegor'yevsk aviation school, which was created on the basis of the school evacuated from Gatchina. During the time of the Civil War, the Moscow and Yegor'yevsk schools trained approximately 500 Red Air Fleet pilots.

In January 1919, the Military Schools for Pilots and Observers, which had a student body of 160, was organized in Petrograd.

Our Party paid special attention to political work in the aviation schools. The Central Committee of the Russian Communist Party passed a special resolution concerning intensification of political activities in the aviation schools in which it was stated, partially:

"In view of the importance of the political education of future commanders and fliers in the Red Air Fleet, the Central Committee of the Russian Communist Party proposes to become familiar with the state of Party and political-indoctrination work in these schools and take measures to increase it" [33].

The fliers and technicians of the Air Force responded with warm devotion to the task and our great leader's interest. This can be established by the original certificate, still housed in the V. I. Lenin Central Museum in Moscow, and which shows a hand-drawn balloon, and was given him by the Kiev military okrug.

A great role was played in the creation of Soviet aviation by the scientific research institutes and establishments created in the first years of the Sovier government: the Central Aerohydrodrnamics Institute (CsAGI), the scientific test airfield, etc.

Aviation in the Battles for Soviet Power

Immediately after the victory of the Great October Socialist Revolution, the imperialists begin preparing for an armed assault against Soviet Russia.

In the spring of 1918, at Murmansk in the northern part of the Soviet territory, American and AngloOFrench interventionists debarked, and in early August of the same year, there was an English marine landing at the White Sea Coast. Simultaneously, an English aircraft carrier with short type bi-planes docked at Arkhangel'sk. It was there that the so-called Slovak-British aviation corps, numbering up too 100 aircraft, was formed against the young Soviet Republic. /33

Along with other measures taken to forestall the interventionists, aviation was also depended upon. On 12 August 1918, Lenin telegraphed the commander of the northern front, M. S. Kedrov:

"...You must... make contact with Kotlas, send fliers there immediately, and organize the defense of Kotlas no matter what it takes.

President of the Soviet People's Committee Lenin" [34].

And aircraft were sent to the northern front. Twelve aircraft and their crews were concentrated outside Kotlas.

In spite of the enemy's qualitative and quantitative superiority with respect to equipment, the Soviet fliers courageously engaged him in the air, flew reconnaissance, and systematically made strikes against his land forces, and sunk enemy vessels.

Here is one feat performed by red aviators on the northern front.

The interventionists' aviation had repeatedly attempted to make strikes against objects behind our lines, against cities and the civilian populace. During one such flight, four English aircraft were engaged by the Soviet flier F. F. Smirnov. An equal dogfight ensued. Skillfully managing his maneuvers and his fire, our flier prevented the enemy from reaching its target. Having received rather serious damage, the English aircraft shamefully quit the field of battle, having hastily dropped their bombs to the side of the railroad station.

The Soviet fliers on the northern front in the autumn of 1918 performed dozens of sorties, and logged approximately 150 hours.

Having exhausted the interventionists in heavy battles, in January of 1919 the troops from the northern front took to the defensive and liberated Murmansk and Arkhangel'sk.

Along with the foreign interventionists in the northern Soviet territory, Japanese imperialists were attempting armed intervention in the Far East. In June of 1918, Denikin's White Guard Army began its offensive toward the Kuban'. In early August of that same year, English forces which had landed in Transcaucasia captured Baku, while forces of Kaiser Germany along with White Guards occupied the entire Ukraine and the Crimea, the Don, and other regions of the country.

A revolt of Czechoslovaks began to swell in Siberia and in the Urals, and /34
banking on this the counter-revolutionaries begin to advance toward the left. The newly opened eastern front took on especially great significance for the defense of the Soviet Republic.

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Along with strengthening the eastern front with combined-arms units,

aviation units were sent to the Volga. By August of 1918, what was for that time a powerful aviation grouping had been created along the eastern front. The first Soviet combat aviation group, commanded by I. U. Pablov and consisting of our best pilots, was sent from Moscow to the command of the Fifth Army, which was then outside Kazan'. This group formed the basic combat nucleus of the aviation in the eastern front. The support personnel for this group consisted primarily of workers from Moscow aviation companies. A total of more than 30 aircraft were put at the disposal of the Fifth Army [35].

When aviation squadrons were sent to the front, special banners and credentials were usually presented. The First Socialist Fighter Aviation Squadron under the command of a Red Air Fleet of the Republic, along with its colors, was given this order of the All-Russian Aviation Council[1] which said:

"The insuperable and immortal will of the Proletariat Revolution and the enthusiasm of the mighty power of the class struggle have spurred the Air Fleet to new combat readiness. Given wings by the strength and power of the proletariat class, tested and tempered by the heroic struggles for the success of our great precepts toward the creation of a new society, the Workers' and Peasants' Red Air Fleet has become the illustrious comrade in arms -- the friendsof all the Red Army and its vigilant and watchful guardian across the far horizons of the fields of battle of a RSFSR. The First Fighter Aviation Squadron, under the command of a first Soviet group is the first of the first, created and guided under the protection of the All-Russian Council of the Air Fleet and its historic banner, the aerial scrimmager in mortally daring battles, the most praise worthy of the praise worthy fighter squadrons in the heroic family of winged Red fighters. The All-Russian Council of the Air Fleet entrusts its banner, in whose crimson sheen there exists the bright blood of our downed red eagles, for new battles and victories for our communist ideal.

Glory to the fury of the brave!"

The Red combat fliers on duty near Kazan' were the first in the Civil War to start sending strikes in groups of seven to 12 aircraft. The aviation /35
in the Fifth Army was successful in this direction. Some aircraft made a run on the evening of August 19, dropped their bombs on military targets in the center of Kazan', at Verkhnyy Uslon and on the Raif wharf area.

Eleven crews from the First Soviet Aviation group were given the mission of destroying several White objects in Kazan'. The Soviet fliers destroyed their targets precisely. The high effectiveness of the action was achieved to a substantial degree due to the good organization of aerial reconnaissance. One flier who proved himself to be a remarkable aerial observer was aviation group commissar Ya. T. Konkin, a former Kazan' laborer.

In early September, the enemy made great use of river boats and barges for moving troops and equipment along the Volga and Kama rivers. Aircraft were sent in to break up this movement. The combined forces of infantry,

[1] The All-Russian Aviation Council -- the general organization of aviation and aeronautics workers. It was in existence from 1917 to 1922.

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the Volga flotilla, and the aviation yielded success. On 10 September 1918, the Red Army liberated Kazan' from the White Army.

Photocopy of an Honor Certificate Granted to a Red Fleet Pilot in One of the Aeronautics Units of the Kiev Military Okrug.

The action of the Soviet fliers at Kazan' was given notice in an order by the Republic Revolutionary Military Council.

"Soldiers of the Red Air Flotilla of the Fifth Army!" -- read the order -- "the entire republic was witness to your incomparable heroism in the historic battles at Kazan'. You rapidly drove the treacherous enemy fliers into the ground. Day after day you closed in on Kazan' held by the White Guards. You created an indispensable reconnaissance, you aided communication between the Fifth Army and the Arsk squadrons... You fearlessly tracked down the foe, dealing death and destruction in his ranks. Honor and glory to you, Red heroes of the Air Fleet!"[36]

During the battles for Kazan', the fliers I. U. Pavlov, I. V. Satunin, G. S. Sapozhnikov, F. A. Ingaunis, A. M. Levitov, observer Ya. T. Konkin, I. N, Dmitriyev, et al., especially distinguished themselves. They were all given credit with various awards.

During the battles for Kazan', Soviet aviation was used broadly in distributing propaganda literature behind enemy lines. From only 16 August to 9 September, over 150 kg of literature were distributed. Among the many leaflets urging battle with the enemies of the revolution was one containing a poem by Dem'yan Bednyy, who at that time in the ranks of the Fifth Army. The title of the poem was "At Kazan'" and began with the words:

F. A. Ingaunis

The aeroplane roars and buzzes,
The pamphlets fall below,
Read, White Guard camp,
What Bednyy Dem'yan has sent you.
Let the victorious ring of my verses
Drop down as the sound of an alarm.
For absolution
Pray, bourgeois! the day of reckoning is near!
[36]

In September of 1918 the troops on the eastern front continued their advance. /37 The enemy's attempt to hold on at the Volga fai'ed. In October he had already been driven back from Syzran' and Samara. The Soviet troops on the eastern front, under whose command at that time there were concentrated over 20 aviation squadsquadrons, constantly pursued the enemy and beat him back to the Urals.

One group which was exemplary in carrying out the combat missions assigned by the command of the Third Army on the eastern front was the First Tver' Aviation Croup, commanded by I. Ya. Ivanov. In September of 1918, I. N. Baryshnikov, F. A. Grab, D. I. Tarasov, et al., fliers in this aviation group, flew primarily reconnaissance missions. During one of these flights by Grab in a Sopwith in /38 the region of Shamara-Shal', a White Guard Nieuport suddenly flew out of the clouds. Maneuvering, the Soviet flier evaded the attack, and the enemy aircraft flew by him. However, gaining altitude, he came behind the observation plane from the rear. Grab, however, quickly made a 180° turn and went into the attacking himself. His observer Schultz fired two short rounds at the enemy aircraft with his Hotchkiss machine gun, and in a burst of flame the enemy fell to the ground.

In August-September of 1918, aviation units in the eastern front made several hundred sorties. The First Aviation Group alone logged over 300 hours and dropped 1,600 kg of bombs. Several supply dumps and headquarters were destroyed, and much enemy equipment and many personnel were lost. The first two aviation squadrons to distinguish themselves in battle were awarded honorary designations: the Fourth Socialist Sqaudron from Kazan' and the Twenty Third from Sviazh.

In the summer of 1918, Grasnov's White Guard Army launched an offensive aimed at encircling and capturing Tsaritsyn. The counter-revolutionary troops were supported from the air by the British Fourty Seventh RAF Squadron.

In early August, a Soviet aviation squadron consisting of six observation planes and two fighters reached Tsaritsyn. It repulsed flights by enemy aviation, dealt blows to his ground forces and equipment, and carried out intense aerial reconnaissance missions.

I. V. Satunin

N. N. Vasil'chenko

In the autumn of 1918, 20 aircraft were concentrated outside Tsaritsyn. In the future, four aviation squadrons and two groups with the total strength of over 40 aircraft would be in action there.

Upon command from the authorities, the fliers carried flights over Krasnov's troop displacements and dropped leaflets with the emblem of the Revolutionary Military Council of the Northern Caucasian Military okrug. As a result, the number of deserters to the Soviet side increased sharply, and the enemy's morale and spirit dropped equally sharply. /39

In the battles of Tsaritsyn, the aviation operated in close contact with ground troops. Special instructions were worked out which determined the order of de ignation of ground troops by position using signal panels, smoke signal rockets and other means. It was vital that the pilots give the signals properly to permit the group troops to identify the affiliation of the aircraft. According to an order from the Revolutionary Military Council of the North Caucasian Military okrug, a communication service utilizing aircraft was organized. Personnel were designated among the ground troops who were responsible for communication with the aircraft.

The Soviet pilots performed successfully in the battles at Tsaritsyn.

On one day in September of 1919, three English bombers appeared over the battle field in the region of Chernoye Yaro. They were covered by three Sopwith fighters. The pilots D. N. Shchekin and A. P. Korotkov, who were on duty at the airdrome, took to the air. A fierce battle between the two Soviet fighters and the six English aircraft ensued. The air was filled with the constant sound of machine gun fire. The Red fliers quickly assumed the initiative. Their unflagging determinating to vanquish the enemy and their daring maneuvers wrought confusion among the English who, attempting to lighten their aircraft, hastely dropped their bombs to the side of our troops and made a hasty retreat to the west.

However, one Dehavilland bomber began to slow down and lose altitude. This situation was quickly seized upon by Korotkov, who had been flying above and behind the enemy aircraft. He forcefully aimed his aircraft at the enemy. Before the English fighters could hurry to aid their comrade, Korotkov dealt the enemy bomber a blast of fire right on target. The enemy burst into flame. With a quick maneuver, the Soviet flier evaded the attack by the English fighters. By this time he was assisted by Shchekin, whose courageous attacks forced the enemy to rapidly withdraw from the battle field.

In 1919, the combined troops of the interventionists and the White Guards launched an offensive against the young Soviet republic first from the east, where Kolchak's Army was active, and then from the south, where Denikin's troops were concentrated. Spring saw the most dangerous situation for the Soviet country become even more complex on the eastern front.

By this time, the young Soviet Air Force had acquired more organization. It now counted three okrug (district) and six field commands at the front, 13 army, 47 observation, 12 fighter, seven special, and 25 aeronautics squadrons and various service elements of units and rear establishments [37]. /40

Along with the Red Army, it actively participated in the combat actions against Kolchak's troops. On the eastern front, the Soviet command concentrated 17 aviation squadrons totalling approximately 100 aircraft.

In the spring of 1919, in view of fuel shortages, the thaw, and bad weather conditions, the Soviet fliers made only 50 combat sorties for reconnaissance and destroying enemy equipment and personnel.

The "Aviation Garrison" of Ural'sk on the Eve of the Seige of the City. At the Farman-30 Aircraft there are (left to right): Observers V. Shaposhnikov and P. Olekhnovich, Pilot G. Artamonov, Assistant Engine Mechanic F. Kryuchkov, L. Tarasov, et al., 1919.

Outstanding heroism and inflexible will to victory were shown at this time in the garrison of the town of Ural'sk, which also included a flight team. The Ural'sk White Casach group, which had obtained aid from the interventionists, surround Ural'sk in April of 1919. The beseiged garrison held out for three months, valiantly repulsing repeated attempts to break into the city streets.

Our aviation took an active part in the battles at Ural'sk. Soviet fliers systematically performed reconnaissance, established communication between the beseiged and the front-line troops, and repeatedly carried command representatives to Ural'sk to acquaint them with the situation at the Red garrison. The aircraft also delivered spare parts for the radio as well as documents, money, tobacco, newspapers, and ciphers for communications and letters to the city. /41

A. M. Labrents and A. Ya. Lukanidin, the commanders of the Twenty Sixth and Thirty Third Aviation Squadrons, were particularly outstanding at Ural'sk. Attacking the enemy from low altitude, carrying out detailed reconnaissance and delivering supplies to the garrison, they carried out the greatest number of combat sorties. For the heroism they displayed, these fliers were awarded the Order of the Red Banner.

By Order No. 224 of the Revolutionary Military Council of the Republic dated 10 September 1919, on the occasion of Labrent's commendation, stated partially: "...In the battles at Ural'sk, taking part in the combined attack against the Ural'sk garrison, he aided in the success of our troops by his flights, outstanding for their unparallel bravery and courage, in which he flew as low as six meters off the ground. His Ural'sk Altat flights permitted comrade Labrents to maintain the closest communication between the army troops and the cut-off city. Constantly working under heavy enemy machine gun fire, he inspired the garrison by his brave flights, and was of great aid to our troops" [38].

A. M. Stepanov also flew brave flights to beseiged Ural'sk. His aircraft was subjected to fire during his flight over enemy territory, during landing, and during takeoff in the city. However, through the period of the blockade the courageous flier succeeded in completing 21 combat flights and dropped 416 kg of bombs. For the heroism he displayed in battle, the flier Stepanov was also awarded the Order of the Red Banner.

On 28 April 1919, the troops of the southern group of the army of the eastern front, commanded by M. V. Frunze, pushed in a counter offensive from the region of Buzuluk. The front-line aviation, reinforced with aircraft and personnel to start the offensive, arrived from Moscow and deployed active combat actions. During this time there were 18 aviation squadrons making up the eastern front.

During the Ufa offensive operation (May-June 1919), combat action by the aviation reached its maximum intensity. Soviet fliers neutralized enemy artillery batteries as our troops forced the Belay River to the north of Ufa, while our fighter pilots covered the troop crossing of Chapayev's Twenty Fifth

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Division from attack by Kolchak's aviation. During the battles to liberate Ufa, Soviet aviators displayed true heroism and bravery in carrying out their combat missions.

Thus, for example, the flier A. I. Tomashevskiy bravely flew at low altitude over the streets of Ufa, fighting the enemy with bombs and machine gun /42 fire. During one of his aerial reconnaissance flights, Tomashevskiy made a forced landing on enemy-held territory. This was observed by the White Kazaks, and they opened heavy fire. However, the flier did not lose his head and jumped out of his aircraft. Quickly straightening out the problem, he took off under enemy fire and, having delivered his vital dispatch to the command, again took off on a combat mission.

During the Ufa operation, a total of more than 100 combat sorties were flown for reconnaissance, fire covering, dive bombing attacks against enemy troops and equipment, and various other combat missions. For their heroism and bravery, the Red fliers A. I. Tomashevskiy and I. G. Savin and others were awarded the Order of the Red Banner.

Overcoming resistance by Kolchak's troops, the Red Army rapidly rolled forward.

The Anglo-American imperialists attempting to ease the pressure put on Kolchak's Army by the onslaught of Soviet troops, in May 1919 organized General Yudenich's march on Petrograd.

By this time, 17 aviation squadrons (including seven naval squadrons) totalling 87 aircraft had concentrated outside Petrograd. The aviation squadrons at the Petrograd front and those of the Baltic Fleet were united under a single command with authority as a specially organized aviation group headquarters.

In conjunction with the ships of the Baltic Fleet, the aviation carried out strikes against such objects as ships of the English squadron, airfields, and large fortified positions. In addition, the aircraft carried out aerial reconnaissance and dropped pamphlets.

The fighter pilots and the antiaircraft batteries constantly repulsed assaults by enemy aircraft. They destroyed and damaged approximately ten English aircraft. At the Commandant's airfield in Petrograd, fliers were kept on round-the-clock alert, ready for takeoff.

Soviet troops, reinforced by the addition of workers and communists from Petrograd and Moscow, in June 1919 began a decisive counter offensive, and knocked the enemy from the walls of the city -- the cradle of the revolution.

However, in late September of 1919, Yudenich's troops again began an assault. On 15 October, Petrograd was beseiged. This created a very tense situation.

Throughout this time, and under difficult weather conditions, fliers from

the naval and ground aviation performed vital missions for the command: they made strikes against the troops and armored trains in Yudenich's army, they carried out intense aerial reconnaissance, and destroyed railroad stations and /43
echelons. They also dropped a substantial number of propaganda leaflets. Logging approximately 350 hours, the Soviet fliers made their contribution to the defeat of the White Guard troops at Petrograd. Yudenich's troops suffered a rout. Another venture on the part of the counter-revolutionaries had been defeated.

The imperialists could not subdue the growing Soviet power in Russia. In the summer and autumn of 1919, the center of gravity of the battle shifted to the south of the country, where Denikin's White Guard army was maneuvering.

Early in the advance, Denikin's troop numbering in the thousands had 22 aviation squadrons numbering 200 aircraft, primarily the most modern foreign designs. Denikin's aviation units were equipped with the latest English Dehavilland (DH-9) aircraft. His crews included English and American fliers and mechanics, instructors and special advisors.

Against Denikin's Army there were 23 Soviet aviation squadrons with a total number of 130-140 aircraft. Among these, however, 70 were unserviceable and needed repairs.

The situation was especially grave with respect to aviation fuel. Existing supplies were running low, and at the same time the main sources were in the hands of the enemy. Therefore, it became even more necessary to replace aviation fuel with various substitutes such as the so-called "kazan mixture" consisting of alcohol, ether, toluene, and other components. However, this mixture did not give engines their full power: it corroded metal and rubber hoses.

The aviation units were experiencing dire needs for rubber for aircraft wheels. Often instead of rubber tires, several layers of towing ropes were wound around the wheel.

These were difficult times for the young Soviet Republic. In the south, the enemy had occupied Orel, and was approaching Tula. On the southeast front, our troops were heroically defending Tsaritsyn. Here, Soviet aviation squadrons of the Tenth Army, under the command of V. V. Khripin distinguished themselves by valiantly engaging superior enemy forces.

Under conditions of defensive battle to the south, in the summer of 1919 Soviet aircraft successfully made strikes against the advancing White Guard troops and their armored trains, and actively maintained communication with individual troop groupings.

On 5 August 1919, a White Guard cavalry corps under the command of General Mamontov broke through the front of the Eighth Army and advanced to the rear of the southern front. An extremely grave situation developed.

In working out means for routing the White Guard cavalry which had broken /44

through, Lenin directed the attention of military specialists to the role and value of the ground-support action of aircraft. In a special communication to the Revolutionary Military Council of the Republic, Lenin raised the following question:

"(The *Cavalry* is defenseless against the aeroplane when it flies low).

"Comrades Sklyanskiy! Can you answer this to the *apprentice* military man X, Y, Z: how are (fast) aeroplanes against cavalry! *Example*. Flight is *quite low*. *Example*. To instruct the basic "science" (I once read of this, but a certain "practical man" *I. N. Smurnov* laughs at it and considers it nonsence). *Lenin*".[39]

To deal with Mamontov's corps, an order from the Revolutionary Military Council of the Republic especially created a special-purpose aviation group consisting of aircraft of the Fourty First and Fifty First Observation and Eighth Fighter Squadrons, two Ilya Muromets Flying Ships, and a squadron of the best flight instructors from the Moscow Aviation School. In September of 1919, the group was reinforced by crews from two other aviation squadrons of the Eighth and Thirteenth Armies. Heading the group was the flier Yu. A. Bratolyubov, head of the Moscow Aviation School.

Yu. A. Bratolyubov

The personnel from the special-purpose group had deep love and admiration for this remarkable commander and flier. By his flight expertise and outstanding qualities as a fearless aerial fighter, he had earned great authority. He constantly strove to instill the same qualities into subordinates.

The special-purpose group carried out the Command's most demanding orders. Its primary task was to determine the location of the main forces in Mamontov's corps, their make up and their direction of movement.

In spite of danger of being captured by Mamontov's single kazak mounted patrols, the fliers from the group systematically launched bombing and assault attacks against the enemy from both aerodromes and landing fields. Working with small groups, the fliers Yu. A. Bratolyubov, B. N. Kudrin, and Ye. M. Gerasimov and others launched low-altitude bomb assaults and strafed enemy troops and equipment with machine-gun fire. The bombs were dropped by hand: the flier would remove a bomb from a sack, rest it on his leg and, after activating the fuse, throw it over the side of the aircraft with one hand. The effect upon morale caused by these low-flying and bomb-dropping aircraft was tremendous. The actions of single crews would sometimes result in the combat incapacity of entire cavalry units. One of the participants in the battle with the cavalry -- B, N. Kudrin -- has written in his memoirs: /45

"In my first encounter, I ran into a squadron approximately 100 men strong as I flew at an altitude of 200 to 300 meters at approximately 3 kilometers visibility. The horsemen, moving off the road, took off at a full gallop towards a copse visible in the distance. So as not to lose them with such limited visibility, I sharply pulled left at full throttle into a vertical bank with a turn of 180° and, dropping altitude as I approached, gave them a long burst. In such a maneuver the position for firing seemed to be quite unsatisfactory. I don't think that I did a great deal of damage to them with my fire but when, continuing to fire, I approached the squadron at a distance of a dozen meters, in front of my eyes I made out the most unexpected picture: these frightened horses were rearing, throwing the riders, and lunging. At this sight, I made a steep vertical dive directly over the ground and almost over the heads of the riders. This was where my aerobatic schooling really served its purpose! I succeeded in firing only occasionally, but even without this I left hardly a trace of the cavalry detachment" [40].

The aircraft from this special-purpose group played an important role in liquidation of Momantov's raid. In battles with Denikin's White Guard Army, the Soviet pilots repeatedly show their heroism and selflessness, their flight expertise, and their political and morale superiority over the White Guards and foreign fliers.

On 21 September 1919, Yu. A. Bratolyubov, commander of the aviation group, and a flier Ye. M. Gerasimov flew out to carry out a vital combat mission. En route, they observed a large concentration of White Guard troops which had broken ranks to rest. The brave fliers strafed the enemy, but during the battle Bratolyubov's aircraft was downed. The commander made a forced landing /46 and set fire to his aircraft so that it would not fall into enemy hands.

The flier Gerasimov decided to land and pick up his commander with his own plane. Making a circle, Gerasimov came in and landed. During his landing, his plane suffered damage. At this time, the White Kazaks who had arrived at the point captured both fliers. They sent the heroes to Kharkov, where they fell before a firing squad.

Throughout their battles with Denikin's army, during only October and November of 1919, the Soviet fliers made more than 400 combat sorties, and during the rout of Denikin's troops they completed more than 1,600 sorties and dropped several thousand kilograms of bombs and a large number of pamphlets.

The interventionists did not achieve their goals. The Red Army liberated the Ukraine, Urals, the Donbass and Siberia, regions rich in wheat, oil, coal and iron, which were desperately needed by both the civilian populace and industry. Here began a period of respite.

However, peace did not last long for the Soviet people. In April of 1920, White Polish troops armed with American, English, and French machine guns, tanks and aircraft, attacked the Soviet Ukraine. Vrangel begin his advance on the Donets industrial region from the Crimea.

French, American, English and even Italian fliers took a direct part in helping the bourgeois Polish.

In all, the Polish aviation had at its command 12 observation squadrons, five fighter squadrons, and three bomber squadrons with a total number of approximately 300 aircraft.

Even before the onset of the enemy advance (late March 1920), aviation units which earlier had taken part in the routing of Kolchak and Denikin's troops were sent to the western front.

At the moment of the decisive battles, i.e., in mid-July, a Soviet command had concentrated 51 aviation squadrons on the western and southwestern fronts; the squadrons numbered 210 aircraft. The aviation aided the troops on the western front to withstand the enemy assaults, and subsequently were to carry out many successful operations during the enemy's defeat.

By order of Lenin, the aircraft were widely used for distributing propaganda literature. Vladimir Ilich in those days demanded that we: "...Increase ten-fold our agitation from aeroplanes for the Polish workers and peasants, from the capitalists are robbing of freedom and subjecting to fruitless bloodletting" [41].

I. U. Papiov

The Soviet fliers fought on the western front heroically and with great expenditures of physical efforts and morale. Thus, the flier N. I. Petrov in May alone flew 36 combat sorties, while during the First World War fliers averaged six to ten combat missions per month. /47

In maintaining the breach in the ranks of the First Polish Horse Cavalry Army, the aviation group headed by M. P. Stroyev distinguished itself early in its combat career, this aviation group (three squadrons) numbered over 20 aircraft. Its fliers had good combat experience, and more than half of them were communists.

During the period of preparing for the breach, the fliers from the group flew careful aerial reconnaissance and established concentration points of enemy troops and the positioning of enemy strong points. The data achieved by aerial reconnaissance made it possible for the Soviet command to accurately determine the situation and select the direction for the main thrust. This made possible a perfect breach, which played a significant role in routing the White Polish Army.

Logging approximately 300 hours in May and June of 1920, the fliers from the aviation group made bombing and assault runs against various objects and

systematic aerial-reconnaissance flights, as well as maintaining uninterrupted communication which helped our troops liberate Kiev and push on to a further offensive in the direction of L'vov. The glowing commendations by the commanders of the First Horse Army with respect to the actions of the Red combat fliers are well known.

"Morale was at its highest in the troop units after the work accomplished by our fliers, and recommendations for them are outstanding. Everyone, without exception, is deeply indebted and grateful for the bravery and the work done by fliers from the First Horse Army", said one of the recommendations from this period.

In combat with the White Polish Army in the summer of 1920, the fighter pilot P. S. Shelukhin received his baptism by fire. Twice a day he flew /48
missions to fulfill various tasks; carry out reconnaissance, assault enemy troops. He also flew communication runs for the headquarters of the Twelfth Army and the First Horse Cavalry Army, which was maneuvering behind enemy lines. During one of his missions, Shelukhin noted the displacement of a large enemy assault grouping. On 20 August 1920, he was awarded the Order of the Red Banner.

In battle with the White Polish Army, the Soviet fliers performed many varied tasks. They carried out aerial reconnaissance, dispersed cavalry attachments, bombed defensive positions, railroad stations and echelons, systematically dropped propaganda literature, and successfully engaged in combat with enemy aircraft: several successful missions were flown against enemy aerodromes, and more than 30 aerial battles were fought.

Along with the broadening application of aircraft, the organization of all its combat missions improved. The aviation squadrons were broken down into larger or smaller units called groups. Special documents began to be worked out planning the combat activity of aviation. Direct communication was established between the headquarters of the aviation and combined-arms units, which were working together.

Pilots of the Red Air Fleet flew a total of over 2,000 combat missions against the White Polish Army during their time of combat.

In October-November of 1920, the troops of the southern front commanded by M. V. Frunze carried out decisive operations in liquidating Vrangel's troops. The ground troops were actively supported by aviation, in two groups -- the central group headed by I. U. Pavlov and the Right Bank group headed by I. K. Spatarel. On the Crimean section of the southern front, 45 combat aircraft were concentrated against 53 enemy aircraft, and the aviation groups were staffed by experienced combat fliers. To maintain uninterrupted support of the ground troops, the aviation squadrons constantly moved from one aerodrome to another. Especially successful was the aerial reconnaissance carried out by the fliers on the southern front. They aided the command with data which made it possible to accurately evaluate the situation and take the necessary steps.

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During the period when Vrangel's troops were being defeated, our aircraft were concentrated in the direction in which our troops were making their main thrust. At this time, missions were being flown by groups of up to ten to 12 aircraft each, a substantial size for that era.

Many Soviet fliers manifested their heroism and bravery in battle against Vrangel's men. Especially noteworthy were the fliers N. N. Vasil'chenko, who twice in 1920 was awarded the Order of the Red Banner. Here is an example of one of his aerial fights. /49

Returning from a reconnaissance mission on 12 August 1920, Vasil'chenko observed a flight of seven enemy aircraft flying out on a mission to bomb a river crossing. Making use of his advantage in altitude, the flier succeeded in approaching the enemy unnoticed, and suddenly attacked the leader. An uneven battle was launched. The Soviet flier handled himself bravely and decisively. Two enemy aircraft were downed, and immediately they turned back to their own territory. Those remaining rapidly getting rid of them bombs, hastely left the field of battle. Vasil'chenko emerged the victor and had succeeded in denying the enemy the opportunity to bomb the crossing, which was occupied by our troops and equipment bearing explosives.

B. N. Kudrin

Enemy aircraft were not only destroyed in aerial battles, but also at the aerodromes, which were usually subjected to raids by the Ilya Muromets Flying Ships.

On 8 September 1920, A. K. Tumanskiy, commander of an Ilya Muromets ship, flew a successful strike against the railroad station at Dzhanka and the aerodrome at the Vederovka station. About this remarkable achievements the newspaper Izvestiya said at that time: "On 8 September of this year, an Ilya Muromets type aircraft of the Red Air Fleet, operating on the southwestern front, made a remarkable flight under the command of the Red combat pilot comrade Tumanskiy with the object of destroying aircraft at the enemy aerodrome. In spite of heavy rain hindering the flight, Tumanskiy inflicted heavy damage against the enemy, bombing his aerodrome and destroying four aircraft of the six lined up for takeoff.

"For his brilliant flight which yielded such destructive results, comrade Tumanskiy was awarded the Order of the Red Banner by the commander of the N-th Army" [42].

Members of the Board on the Administration of the Air Fleet of the Republic. Seated (left to right): P. S. Dubenskiy, K. V. Akashev and Z. Ya. Landau; standing: A. V. Sergeyev, Ye. I. Akhmatovich, A. D. Anoshchenko and F. I. Bychkov.

The Soviet aviators who participated in the defeat of Vrangel's troops on the Crimean front flew 1,000 sorties. /50

Throughout the period of the Civil War, they flew approximately 20,000 sorties and logged 25,000 hours. Soviet fliers dropped over 94,500 kg of bombs, and a larger number of propaganda pamphlets. They engaged in 144 instances of aerial combat.

During this Civil War, the organizational structure of the Air Force changed also. Whereas during the early years of the war the basic organizational unit was the aviation squadron with a complement of six aircraft, which supported the combat actions of infantry divisions, by the end of the war these squadrons had been combined into aviation groups which were being used in several major ways.

The squadrons were divided into categories of either reconnaissance, fighter, or artillery. In 1919, the air division of heavy bombers consisting of Ilya Muromets aircraft was created.

The basic principle of the combat application of the Air Force during the period of the Civil War was that of massing the aircraft in the major directions. Thus, for example, early in the period when the troops on the eastern front reverted to a counter-offensive (May 1919), approximately 40% of all our aircraft were concentrated here. The rest were on the northern, western, and southern fronts. However, when Denikin's Army emerged as a major threat to

the Soviet nation, more than 40% of our aircraft were concentrated on the southern front.

V. I. Lenin and Ya. M. Sverdlov Observe the Flight of a Soviet Aircraft over Red Square on 1 May 1918. Reproduction from a Painting by the Artist P. Andrianov.

In generalizing the combat operation of our aircraft during the early years of the defense of the Soviet state, the Field Directorate for Aviation and Aeronautics at the headquarters of the Revolutionary Military Council for the Republic worked out and presented, in June 1919, a draft Manual for the Application of Aircraft during wartime. This manual formulated the basic principles of the combat application of the Air Force and the tactical operation of aircraft.

The manual indicated that the proper combat application of aircraft required: "1) skillful and decisive grouping of weapons; 2) assigning missions by priority; 3) matching up missions to the technical capability and quality of the one responsible to carry it out" [43].

The Manual also dealt with questions of the tactical application of Soviet aircraft. One of the authors on the war-time application of aircraft was A. N. Lapchinskiy.

P. I. Baranov Ya. I. Alksis

At the Flight Command Point (left to right): Regimental Commissar I. T. Chernyshev, Colonel A. I. Gusev and Brigade Commander A. Z. Ustinov 1939.

The Civil War was successfully concluded. The Red Army, created and guided by the Communist Party and its leader V. I. Lenin, had routed the combined forces of international imperialism and the bourgeous landowners of

Crew of the Aircraft Rodina (Homeland): (left to right): Heroes of the Soviet Union P. D. Osipenko, V. S. Grizodubova and M. M. Raskova.

the counter-revolution, and the Great October Socialist Revolution had emerged victoriously. /51

The young crews of the Soviet Air Force had selflessly aided the Red Army in the defense of the Soviet Republic from both internal and external foes during the years of the Civil War. Soviet aviators, especially communists, had manifested high political consciousness and activity as well as high combat expertees.

In the building of the Workers' and Peasants' Red Air Force during the years of the foreign military intervention and the Civil War, the Communist Party had paid special attention to the initial Party organizations within the aviation and aeronautics units. The Party organization within a squadron under the command of a military commissar was the organizational center, upon which the commander relied in the solution of concrete practical problems. An important role in the life and military activity of the aviation units was played by the military commissar. Emissaries of the Party, they carried out substantial organizational and political-education work among the personnel, applying all their efforts to the task of strengthening the combat readiness of the young Air Force. Many of them were members of the old Bolshevik Guard. Thanks to their revolutionary enthusiasm, bravery, high morale, political and business abilities, the basic masses of military commissars successfully met the tasks assigned them and used their well-deserved authority among the personnel of the aviation units.

In commenting on the heroism shown by communists during the period of the foreign military intervention and the Civil War, V. I. Lenin wrote: "...every-time a difficult moment would arise during the war, the Party would mobilize the communists, and they would be the first to lose their lives in the front ranks; they died by the thousands at the front fighting Yudenich and Kolchak; those who perished were the best of the working class, who sacrificed themselves, understanding that although they would die they would save generations, they would save thousands and thousands of workers and peasants"[44]. /52

Aviation Military Commanders during a Reception at the Peoples' Commissariat of Defense of the USSR. Seated: K. Ye. Voroshilov and Ya. I. Alksnis. Standing (left to right): A. I. Todorskiy, F. A. Ingaunis, V. V. Khripin, V. K. Lavrov, A. I. Lapin and V. K. Berstrem. 1937.

I. K. Spatarel'

V. L. Mel'nikov

The history of the Civil War is full of examples of the unparalleled courage of Soviet fliers who were unquestionably devoted to their people and the Communist Party. For their bravery and heroism, demonstrated in the battles against the White Guards and the interventionists, 219 fliers and observers were awarded the highest government honor -- the Order of the Red Banner; 16 fliers were awarded this honor twice. Among them were: I. F. Voyedils, S. Ya. Kopf, V. L. Mel'nikov, A. K. Petrenko, I. I. Petrozhitskiy, Ya. Ya. Gulyayev, A. D. Shirinkin, et. al. The fliers I. U. Pavlov, P. Kh. Mezheraup and S. A. Monastyrev were given this award three times.

Especially outstanding among the aviation units were the First Fighter Division, the Ninth Aeronautics and the Thirty Fifth Observation Squadrons, and the Fifty First Heavy Bomber Squadron -- all of which were awarded the Honored Revolutionary Red Banners of the All-Russian Central Executive Committee and the Central Executive Committee of the USSR.

Outstanding heroism on the part of the fliers during the Civil War was made known in an order by the Revolutionary Military Council of the USSR issued in honor of the first celebration of Air Force Day, 18 August 1933:

"Many glorious pages in the historic victory of the Red Army have been written with the blood of the best sons of the working people, who perished in combat against enemies of the proletariat revolution during the Civil War, the blockades, and the intervention.

"An exceptionally glorious role in this struggle was played by our Red fliers, who ignored the imperfections and obsolescence of the aircraft of the day" [45].

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CHAPTER 3

SOVIET AVIATION DURING THE PERIOD OF THE BUILDING OF SOCIALISM (1921-1941)

ABSTRACT. The struggles of the young Soviet Union are described in building an adequate Air Force between the world wars. The operations of Soviet aviators during the Spanish Civil War are described. Soviet aviation operations defending the Mongolian people's republic from Japanese invasion in 1939 are also described. Reorganizational steps taken just before the beginning of the second world war are noted.

In Accordance with Lenin's Behests /53

Having defeated the armies of the foreign interventionists and the internal counter-revolutionaries, the Soviet people under the leadership of the Communist Party set about in the peaceful building of socialism.

The transfer toward this peaceful building took place under difficult international and internal situations. As a result of the two wars, the country's national economy was in a shambles. World-wide bourgeoisie, especially that of the American and English imperialists, was preparing a new war against our homeland.

V. I. Lenin repeatedly foresaw the new military threat from the imperialist nations. In his report to the IX All-Russian Congress of Soviets in December of 1921, he said, partially: "...the first precept of our policy, its first lesson... which must be learned by all workers and peasants... is to be on the alert and to remember that we are surrounded by people, classes, and governments which are openly expressing the most bitter hatred toward us. We must bear in mind that we are always on the edge of invasion" [46].

V. I. Lenin instructed our Party: "...The Red Army... no matter what... must constantly maintain military preparedness and strengthen its combat capability" [47].

NASA

In putting Lenin's advice into action, the Soviet people took all measures towards strengthening the country's defensive capabilities,

strengthening the armed forces and its component -- the Air Force.

The Communist Party and the Soviet government paid especially attention to the development of aviation. In so doing, they based their actions on the /54
premise that its value for national defense would constantly increase. At the same time it was felt that our Air Force was still lagging behind all the latest indications of the level of the Air Forces of the major capitalist countries. In 1921, M. V. Frunze stated: "An especially important role in future conflicts will be played by the Air Force. We have known as such, or at least we cannot consider that we have one as embodied by our few hundred aircraft, which among our pilots have picked up the nick-name "coffins" [48].

The unsatisfactory situation in our aircraft pools was explained by the overall collapse of the country's economy, and primarily by the weakness of the aircraft industry. Throughout 1921 and 1922, the production year in our aircraft factories produced only 43 aircraft and eight engines [49]. Naturally, at such a rate, the aircraft industry could in no way aid the futher development of the Air Force. Therefore, it was decided to first rebuild the aircraft companies in the country, staff them with laborers and engineering and professional cadre, and seek funds for financing the building of new factories and the construction of aircraft.

In spite of the limited economical and financial capabilities in the country, on 18 February 1921 V. I. Lenin signed a protocol at a meeting of the Lower Sovnarkom (Soviet People's Commissariat) on allocating funds for reconstructing aircraft factory No. 6 (the former "Renault"). In 1921, a total of three million gold rubles were set aside for the reconstruction of the aircraft industry.

The Plenum of the Central Committee of the Russian Communist Party, meeting in August of 1922, advised the government to "allocate to the military command 35 million rubles in gold for the development of aviation, of which 20 million in 1922 and 15 million no later than 1 April 1923" [50]. This was a tremendous amount for that era. The funds were intended to create an Air Force required by the interests of national defense. However, even this amount of funds was insufficient to finance the young Air Force. Therefore, the Party turned to the workers of the country with a call to contribute their savings to the fund for building the production and engineering basis of aviation. Direct control of this work was given to the Society of Friends of the Air Force, created in 1923, which in only its first ten months of existence collected three million gold rubles. After a year and a half, the funds collected by the society made it possible to build 55 aircraft and order another 65 from the aircraft industry.

Aircraft factories were not only reconstructed, but partially expanded as /55
well. Aircraft production increased year by year. Whereas in 1923/1924 the production year for the Air Force yielded only 13 combat aircraft from the industry, as early at 1924/1925 it had already jumped to 264 [51].

Taking into account the noticeable change in the field of aircraft construction, the government found it possible to eliminate the purchase of aircraft abroad. M. V. Frunze in his report to the Third Congress of Soviets of the USSR on 19 May 1925 noted: "In the three-year period just prior to 1925 we bought a total of over 700 aircraft from abroad. This year we haven't bought a single one, and I propose that next year we will have fully achieved the growing production of our aircraft factories" [52]. This was a great victory for our Party and the Soviet people as a whole.

In 1924 a Three-Year Plan for the development of the Red Air Force was launched for the years 1924-1926. At the Third Congress of the Soviets the government was urged to "examine the draft for the development of our Air Force, as developed by the military authorities, as soon as possible and at the same time take steps to boost the Soviet aviation industry, including engine construction, to the level which would maintain the required development of both the Civil Air Fleet and the Air Force" [53].

The decision made by the Congress of Soviets was to play an important role in the development of aviation. The number of aircraft steadily increased. By as early as 1928, the Air Force had ten times the number of aircraft it had had in 1920.

Simultaneously, the Party Central Committee and the government paid close attention to the careful building of aviation technology. At this time, Soviet designers created several of our own Soviet aircraft and engines. Thus, in 1924 the I-2 fighter was added to our armament, and it in turn was followed by the modified I-2a designed by D. P. Grigorovich. The R-1 observation plane joined the ranks of our units. The all-metal ANT-3 observation plane designed by A. N. Tupolev was tested. In 1928 the designer N. N. Polikarpov created the R-5 observation plane and the U-2 (the Po-2) trainer. The fact that these types of aircraft were fully up-to-date is witnessed by the fact that the R-5 and Po-2 were successfully used by Soviet fliers even during the Second World War, when they were used as night bombers.

A. N. Tupolev designed the TB-1, a remarkable plane for that time, with a speed of 145 km/hr and a bomb load of 1,500 kg. This aircraft was the first- /56
borne of our long-range bomber Air Force. In 1928 it went into serial production.

Nevertheless, the mass production of R-5 and TB-1 aircraft, as well as other Soviet design models, was achieved by our industry only after 1929. Prior to our first Five-Year Plan, the Air Force had at its command primarily aircraft built in the USSR after foreign designs, or actually bought abroad [54].

Our country made definite achievements in the creation of aviation engines, although in this aspect of the work the situation was substantially more complex. The production of engines depends substantially on the development of the metallurgical and mechanical engineering industries, whose work, although it had improved by comparison with 1921, still did not answer the demands of the time. As a result, in 1928 our Air Force motor pool consisted of 70% imported engines.

The Po-2

With the object of increasing the combat capability of Soviet aviation, vital organizational measures were taken. First, the central control of the Air Force was reorganized and strengthened. In late 1921, in conjunction with the fact that the fronts no longer existed, the Field Directorate of the field Air Force (Aviadarm) was abolished. A single control organ was created -- the Air Force Main Directorate. In 1924 this Main Directorate was reorganized into /57
the Directorate of the Air Force of the Workers' and Peasants' Red Army and was subordinate to the Revolutionary Military Council of the USSR. The head of the Air Force Directorate was simultaneously a member of the Council. In December of 1924 this was was awarded to Petr Ionovich Baranov, a true Leninist and Party member since 1912, who had heretofore worked as assistant to the chief Air Force commander in the political section.

In a short time, P. I. Baranov had studied aviation technology and had become a pilot. Having great experience in Party work in the Army, and having good organizational abilities, he lent his personal energies toward carrying out the directives of the Party Central Committee and the government with respect to improving the combat and political preparedness of the personnel within the units and strengthening the political work, military discipline and organization. Under his command, the organizational structure of aviation units and sub-units improved.

In September of 1924 aviation squadrons were combined into groups, which were then designated higher aviation commands. The groups were created with respect to their purpose -- reconnaissance, fighter, assault, light bombers and heavy-bombers. The reconnaissance, assault and light-bomber groups each consisted of three squadrons and totaled 31 aircraft each (among these, 12 were reserves); the squadron consisted of two flights. The fighter group had 43 aircraft (12 of which were reserves) divided into three squadrons. Each squadron had three flights. The heavy-bomber group had two squadrons with three aircraft each. Somewhat later, the air groups were merged into air brigades.

Individual air squadrons numbering 12 aircraft each -- four of them reserves -- remain with the infantry and cavalry corps.

The air groups and individual squadrons, and later the air brigades, were under the authority of the head of the Air Force Directorate for the Military District.

By autumn of 1924, systematically planned combat training had just about been achieved in the aviation units. Training and flights took place only in the summer. During the winter months there was a period of rest. Order No. 732 from the Air Force Chief of the Workers' and Peasants' Red Army, dated 31 October 1924, put an end to this seasonality and lack of planning and training.[55] The theoretical training and training flights began to proceed regularly throughout the entire year. In combat training, more attention was paid to the practical training of the flight and command personnel, and study of the interaction of aviation with ground troops. In the summer of 1926, air /58
units and large Air Force units were separated into combined-arms camps.[56] Studies in the camps wound up with carrying out maneuvers which had been the object of combat training.

The rearming of air units with more modern aircraft made it possible to substantially increase the number of flights and flying time for each pilot. Thus, in 1926-1927 there was almost a five-fold increase in flying time as compared to 1923-1924 [57]. Gradually, night flights grew in number.

The service regulations and field manuals played an important part in the organization of flight and tactical training. In 1923 flight instructions were issued, and in 1924 line units and schools received the USSR Air Force Revisional Drill Regulations Manual and the Provisional Field Manual on the Combat Application of the USSR Air Force, which together with the Field Service Regulations of 1925 were the most important documents regulating the combat and political training of personnel.

The Party Central Committee paid special attention to questions of training flight cadre. The network of aviation schools was renovated and substantially expanded across the country. As early as 1923 there were ten training installations in the Air Force [58], such as the Sevastopol and Borisoglebsk Flight Schools, the Petrograd pilots' combat and theory school, the Moscow School of Special Services, etc. Young men from the working and peasant classes, especially communists and Communist Youth members were taken into the aviation training institutions.

Aviakhim[1] played a great role in the staffing of the flight schools. In

[1] On 23 May 1925 the Society of Friends of the Air Force (ODVF) was combined with the Society of Friends of the Chemical Defense (Dobrokhim) and received the name Society of Friends of the Aviation and Chemical Industries and Defense (Aviakhim).

February-March of 1926, the first recruitment of flight school students took place via Aviakhim on a nationwide basis. Among the students selected were: workers -- 68.2%, peasants -- 18.5%, others -- 13.3%. Party members and candidates accounted for 2.13%, communist youth -- 59.8% and non-Party members -- 18.9% [59]. This makeup in the aviation schools led to a substantial increase in Party and communist youth strata among the personnel of line units, and strengthened the Party's effect in the Air Force. On 1 December 1927, communist fliers represented more than 61% [60].

In 1925 M. V. Frunze noted: "The personnel are the most vital, the most valuable and difficult-to-replenish aspect of our Air Force's fighting power -- we now have it, and this personnel is fully satisfactory. /50

"We have a complete network of Air Force flight and training institutions, and these flight and support personnel who will be graduating from them fully and completely satisfy our present needs at the present level of development of the Air Force "[61].

Great value was attributed to training engineering and command cadre with higher educations. In the summer of 1922, the Red Air Force Institute of Engineers imeni N. Ye. Zhukovskiy was reorganized as the Air Force Academy imeni N. E. Zhukovskiy, and became a forge of both engineering and command cadre for the Air Force.

In December of 1923, the Military Engineering Academy imeni N. Ye. Zhukovskiy created a department of the Air Force service for training Air Force command crews with higher education. However, this department graduated only one class. In 1927 it was temporarily suspended.

Due to the lack of command aviation crews, within the Air Force it became an urgent command function to not only recruit with respect to flight personnel, but also with respect to the best combined-arms commanders, who were highly experienced in the Army and who had graduated from the Military Academy imeni M. V. Frunze or who had finished the courses for commission in non-commissioned personnel. In early 1926, combined-arms commanders who had gone into the Air Force filled only 40% of all the functions provided for by the Tables of Organization of the Air Force, reserved for appointment to personnel with higher military and special education [62].

The list of these commanders included Ya. I. Alksnis, S. A. Mezhenikov, A. A. Novikov, A. I. Todorskiy, V. N. Lopatin, K. V. Maslov, et al. All personnel entering the Air Force from the infantry underwent professional training periods in Air Force units and were graduated from either pilots or observers schools, after which they became fully qualified commanders in large Air Force units. These cadre played an important role in strengthening the Air Force.

A great contribution to building our Air Force was made by Yakov Ivanovich Alksnis. The son of a farm laborer from the former Liflyand province, in 1916 he joined Lenin's Party and remained its true son throughout his life.

During the Civil War, Alksnis fought for the Soviet government. Then, after graduating from the Military Academy, he worked as a chief and military commissar of the Directorate for Troop Build-up and Service of the Main Directorate of the Red Army. In August of 1926 he became assistant Air Force chief, and in June of 1931 was appointed commander of the Workers' and Peasants' Red Army Air Force, filling this post until December of 1937. /60

Alksnis successfully acquired flight skills and studied aviation technology deeply. His high culture, his damands on both himself and his subordinates and his refusal to compromise with failure -- these were the outstanding traits of this great military commander.

Thus, during the trying years when the economy was being rebuilt and industrialization of the country had begun, the Communist Party and Soviet government, in carrying out Lenin's behests, took many steps aimed at strengthening the Air Force. The numbers of aircraft were increased and their quality was improved, a stable organizational structure of air units and large Air Force units was worked out, training was arranged for both the command and engineering staff, systematic combat and political training was instituted, and existing aviation rules and regulations were reworked, and new ones were introduced.

However, in spite of some success, the Air Force had only taken the first steps in its development. It still did not fully answer the demands of the situation at that time. Thus, in 1929 the aviation pool had approximately 82% of its aircraft in the form of observation planes [63]. The Air Force was still equipped primarily with aircraft built in our factories following foreign design or purchased abroad [64]. In quantity, we lagged behind the main capitalist countries. New efforts were demanded in order that we institute a sharp increase in the numbers of Soviet aircraft.

During the Years of the Pre-War Five-Year Plans

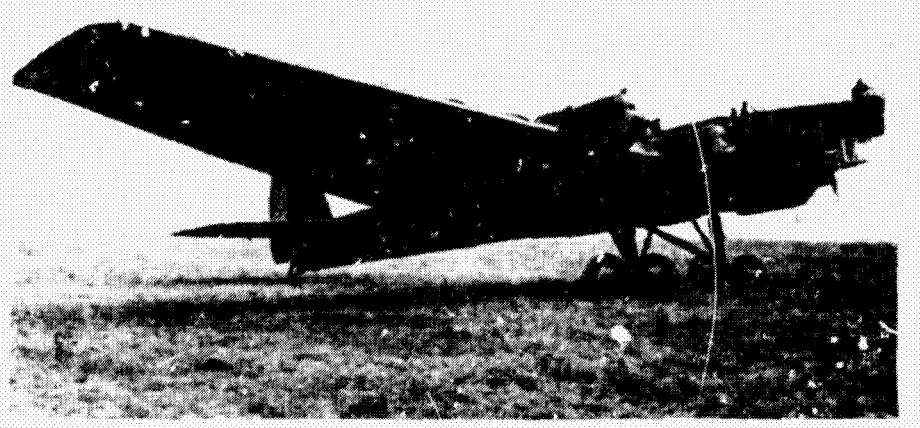
Rapid fulfillment of the country's pre-war Five-Year Plans was of decisive importance in developing the Soviet Air Force. In April of 1929 there was the XVI Party Conference, at which the first Five-Year Plan for the development of the economy of the USSR was decided upon.

Among the number of tasks in this first Five-Year Plan, with respect to building up our Air Force it was noted that we should: pull out from our armament all foreign types of aircraft and replace them with modern aircraft of Soviet production; increase the number of aircraft in our bomber Air Force; raise the number of aircraft to levels surpassing those of our closest enemies, replacing captured aircraft [65]. /61

The basic aims in building our armed forces, including the Air Force, were determined by the decree from the Central Committee of the All-Union Communist Party dated 15 July 1929: "On the state of defense of the USSR." It said, in part: "In coming years, the most urgent task in building the Red Air Force... must be considered... the rapid improvement of its quality up to the levels of the most advanced bourgeois nations, and we must with all our efforts...

spread, cultivate, and develop our own Soviet efforts in scientific design, especially engine design" [66].

During the first Five-Year Plan, our country achieved completion of the socialist reconstruction of all branches of the economy and created a powerful industry which met the needs of the country's defense, including the aircraft industry. By 1933 the country had six large aircraft construction factories and four engine construction factories [67].



The TB-3

Great creative achievements by scientists, aircraft designers, and all the workers of the aircraft industry made it possible to rearm the Air Force with Soviet weapons. At this time, we added to our armament the I-5 fighter designed by D. P. Grigorovich, the TB-3 heavy bomber designed by A. N. Tupolev, N. N. Polikarpov's R-5 short-range bomber and observation plane was put into serial production, etc. /62

A steady numerical increase in the number of aircraft in our Air Force aviation pools continued. By 1 January 1933, the number of aircraft in the Air Force had increased 2.7-fold by comparison with 1928. At the same time the number of heavy-bomber aircraft increased seven-fold [68]. In numbers, the aircraft in the flying units of the Soviet Air Force not only were equal to the biggest capitalists countries, but even surpassed them [69].

At the same time, in view of the fact that during the years of the first Five-Year Plan our aircraft engine construction had been lagging, we did not succeed in achieving a substantial increase in the mechanical and flight characteristics of our aircraft, especially with respect to speed and altitude.

A substantial increase in their quality occurred only during the years of the second Five-Year Plan, when newly designed aircraft were added to our armament which substantially exceeded the single-purpose aircraft of the capitalists countries. These aircraft included: as fighters -- the I-15 and I-16 designed by N. N. Polikarpov; as bombers -- the SB designed by A. A. /63

Arkhangelsk, and the DB-3 long-range bomber designed by S. V. Ilyushin. Rearming the Air Force with these aircraft began in 1936. All of them except the I-15 were single-wing planes with retractable landing gear which, with respect to speed and altitude, surpassed their rivals by 1.5-2-fold.

I-16 Aircraft in Flight.

The aircraft in the Soviet Air Force were armed with the newest machine guns, and had the most modern bomb armament and defense. Thus, during the second Five-Year Plan, the ShKAS aircraft machine gun designed by B. G. Shpital'nyy and I. A. Komaritskiy was adopted as armament. In terms of its rate-of-fire (1,800 rounds per minute) it had no rivals. Whereas prior to 1929 our Air Force was armed with airplane sites which made it possible to carry out bombing runs only along the wind plane, by the end of the first Five-Year Plan we had replaced them with optical sites which permitted bombing along any direction. In addition, mechanical bomb releases were replaced by electrical releases.

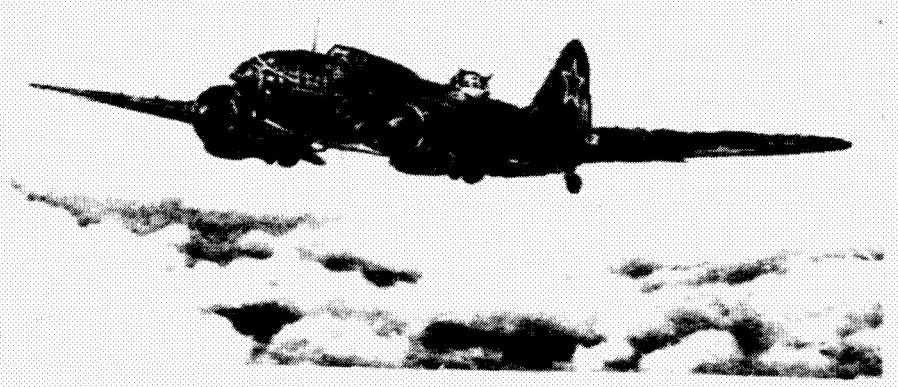
The aircraft crews obtained newer and more comfortable flight suits. To achieve flight at high altitudes, our aircraft were equipped with oxygen systems. We also began to use the parachute as a means of protecting individual crew members. Medical support also improved. This era saw the birth of a new branch of science -- aviation medicine -- which made a study of man's life-functions during flight.

As can be seen by study of Soviet military territory with respect to the role and purpose of the Air Force during the war, during the first two Five-Year Plans there were changes made with respect to the relationships of different branches of aviation. As a result of the decrease in the volume of reconnaissance aircraft, there was a concurrent increase in the volume of bomber and fighter aircraft. In 1938, the volume of bomber and assault

aircraft was 51.9%, that of fighter aircraft was 38.6%, and that of observation aircraft was only 9.5% [70].

At the same time the number of aircraft in line units during the second Five-Year Plan more than doubled as compared to the end of the first Five-Year Plan [71].

The organizational structure of aircraft formations and large units was improved. With the TB-1 and TB-3 taken on as armament we begin to form heavy air brigades consisting of three to four air groups with 12 aircraft each. In 1933 the brigades were combined into Air Corps, which were operational formations and intended for carrying out specific operational missions from the high command [72]. In 1936 began the creation of the High Command Army Air Force Reserve (SPA -- Special Purpose Aviation), which was an operational aviation formation. The organization of other large Air Force units was also changed. During the first Five-Year Plan, instead of combined air brigades consisting of various types of aircraft, we begin to form single-purpose brigades -- bomber, assault, and fighter. /64



The DB-3f Long-range Bomber in Flight.

Basing the decisions on anticipating the character of future war and operations, during the first Five-Year Plans the Air Force Command started forming units and large Air Force units of paratroops. The appearance of this new type of forces made possible the broad development of parachute sports in the country, and the use of the TB-3 by the Air Force made it feasible to drop parachute troops behind enemy lines.

The rapid growth of the Air Force required substantial broadening and improvement in the training of command, engineering, and flight engineering cadre. With respect to training aircraft crews, the recommendations made by the Central Committee of the All-Union Communist Party were presented in the document "The Command and Political Personnel of the Workers' and Peasants' Red Army" dated 25 February 1929 and 5 June 1931 [73]. In accordance with this directive, special attention was paid to the military and technical training /65

and idealogical and political education of the cadre. It was necessary to improve the selection and placement of military personnel and strengthen the Party influence among the Air Force personnel. To this end, the communists and communist youth were repeatedly mobilized in the aviation schools and field units.

The decision taken by the IX Congress of the All-Union Lenin Young Communist League, which met in 1931, concerning the asumption of patronage of the country's Air Force was of special significance with respect to the training of aviation crews. An appeal issued at the Congress and directed toward all communist youth throughout the Soviet Union stated, in part: "It is especially vital that we take upon ourselves the duty of recruiting for Air Force schools, from schools for fliers and junior specialists all the way up to the academies, organizing the preparation of the best of our communist youth for entrance into these institutions" [74].

The Soviet youth readily picked up the call by the Party and the Lenin communist youth. Thousands of young men entered the Air Force at the urging of the communist youth. One of the first to enter the Kachina Aviation School in 1931 was Grigoriy Pantelevich Kravchenko, who had twice been awarded the high honor of Hero of the Soviet Union. Also following the footsteps of the communist youth, Alexandr Ivanovich Pokrshkin, who had been awarded the title Hero of the Soviet Union three times, also went into aviation.

The aviation schools, which substantially increased in number, accepted primarily communists and communist youth members with high school education.

One of the most important measures taken by the Central Committee of the All-Union Communist Party with respect to training aviation command crews with higher educations was the establishment of the command department of the Air Force Academy imeni N. Ye. Zhukovskiy in the autumn of 1929. The faculty trained a substantial number of assistant crew commanders. Many of the students from this department, both prior to the war and during the Second World War, were engaged in command posts in the Air Force, commanding aviation units, formation, and large Air Force units. They included K. A. Vershinin, P. F. Zhigarev, N. P. Kamanin, G. S. Kosykh, S. A. Pestov, S. I. Rudenko, N. G. Seleznev, S. A. Khudyakov and many others.

Along with this command department, early in 1933 an operational department with a one-year course was created at the Air Force Academy emini N. Ye. Zhukovskiy. It trained commanders who had a great deal of work experience in aviation units, headquarters and Air Force command groups. Among the first to be graduated from this department was F. K. Arzhenukhin, G. A. Voroxheykin, S. F. Zhavoronkov, S. A. Krasovskiy, A. V. Nikitin, V. I. Ryabtsev, F. Ya. Falaleyev, et al. /66

Thus, the country saw created a large network of educational institutions aiding the growing demands of the Air Force for qualified command and flight personnel.

In answer to the Party's call, during the first Five-Year Plans Soviet

fliers, aerial navigators, engineers and other specialists performed many heroic deeds which brought glory to our homeland as a great aviation power. Thus, in 1934, Soviet fliers operating under the most difficult conditions saved the members from an expedition and the crew and passengers of the steam icebreaker Chelyuskin. For this operation the fliers M. V. Vodopyanov, I. V. Doronin, N. P. Kaminin, S. A. Levanevskiy, A. V. Lyapidevskiy, V. S. Molokov and M. T. Slepnev were the first in our country to be awarded the high honor of Hero of the Soviet Union.

The entire world was impressed by the remarkable success of the heroic crew including V. P. Chkalov, G. F. Baydukov and A. V. Belyakov who completed two non-stop flights to Udd Island (now Chkalov Island) in 1936 and across the North Pole to the USA in 1937. Our homeland was honored as a great aviation power by the fliers, heroes of the Soviet Union M. M. Gromov, V. K. Kokkinaki and A. B. Yumashev, the aerial navigators S. A. Danilin and I. T. Spirin, and the women fliers V. S. Grizodubova, P. D. Osipenko, M. M. Raskova, et al.

The successes achieved in training command and engineering crews made it possible to rapidly improve the combat and political training of our aviation units and large units. The decree issued by the Central Committee of the All-Union Communist Party and the Council of Peoples' Commissars of the USSR in 1932 was of great importance in carrying out this mission. It mentioned ways to increase flight safety. Work carried out by the command, the political organizers, and the Party organizations with respect to carrying out this proposal aided in the increased combat efficiency of the Air Force. Many units, large units and schools completely overcame their difficulties and achieved outstanding records in combat training.

The Party Central Committee and the Soviet government had a high opinion of the operations performed by Air Force personnel. The resolution passed by the Central Executive Committee of the USSR on 27 May 1934 for good achievements in the field of military and political training and selfless work towards strengthening the combat readiness of the Workers' and Peasants' Red Army awarded the Order of the Red Star to aviation unit commanders and military commissars D. D. Zimm, I. V. Krupskiy, S. A. Mart'yanov, A. I. Mitrofanov, M. M. Ryzhenkov, A. N. Sokolov, A. I. Tayurskiy, A. A. Turzhanskiy and S. N. Kharitonov [75]. /67

The aviation units achieved even greater successes in 1935-1936. As a result of outstanding successes in improving aviation technology and skillfull management of combat and political training, on 25 May 1936 the Central Executive Committee of the USSR awarded the Order of the Soviet Union to 560 commanders, political workers, fliers, engineers and technicians; of these, 119 received the Order of Lenin. Among those who received the Order of Lenin were F. A. Astakhov, M. F. Berezkin, A. V. Borman, M. M. Golovynya, V. K. Lavrov, A. Ya. Lapin, V. N. Lopatin, Z. M. Pomerantsev, S. I. Rudenko, S. P. Sinyakov, S. P. Suprun, A. A. Turzhanskiy, S. A. Chernobrovskiy, et al.

The Order of the Red Star was awarded to Ya. I. Alksnis, P. F. Zhigarev, A. I. Todorskiy, V. V. Khripin, et al [76].

In late February of 1936, the First All-Army Conference on Outstanding Achievers in the Socialist Revamping of Aviation was held; this meeting summed up achievements in combat readiness, and made known the experience gained from the use and repair of aircraft technology. In presiding over the meeting, the chief of the Main Political Directorate of the Workers' and Peasants' Red Army Ye. B. Gamarnik said: "We already have thousands of fine fliers, brave, daring and able; we have many who know their duties well and conscientiously fulfill their duties as engineers, technicians, and engine mechanics" [77]. Now the task of the Air Force lay in introducing the experience of its best men into all branches of aviation and to raise to a higher level the training, combat and political preparedness, organizational ability and discipline. The Conference made some concrete proposals to achieve these tasks. The political organs and Party organizations would maintain a competition between the units and sub-units toward better fulfilling their combat readiness missions.

The combat readiness of the aviation units and commands was tested both during training and in maneuvers. Thus, in 1934 during maneuvers in the White Russian Military District, in which more than 320 aircraft[78] participated, aerial assault jumps were worked out. In 1935, during the maneuvers in the Kiev Military District, in which 600 aircraft participated, an aerial paratrooper assault with a total of 1,200 men was staged. In August of 1937, special aerial maneuvers were organized on the theme: "The operation of front-line aviation and the air army of the High Command early in the war and during conditions of disrupted operations at the front".[79] Studies and maneuvers / 68 made it possible to generalize the positive experience gained in combat readiness, as well as uncover areas in need of work and improvement and concentrate the attention of commanders, political organizers, and Party organizations to overcoming them.

Thus, during the first Five-Year Plan, the Soviet Air Force steadily grew in quantity and quality, and outstanding flight and support crews were trained who proved complete masters of their equipment and unquestionably devoted to their homeland.

In the Defense of our Aerial Borders

During the years of the peaceful Soviet building, imperialist nations more than once took aggressive actions against our country, and the Soviet Armed Forces, in protecting the borders of the Soviet Union, repulsed the imperialist invaders. At the same time, Soviet warriors, including fliers, in fulfilling their international debt, were of aid to the peoples of foreign countries struggling for their freedom and independence.

One of the most important events of those years was the war in Spain. The fascist revolt of July 1936 against the Spanish Republic served as grounds for open Italian-German intervention, whose object was the setting up of a fascist dictatorship in the country. The aggressor countries sent a large contingent of aviation as well as ground troops to Spain.

NASA

However, the Spanish Republic was not alone. It received support, in both material and morale, from peoples around the world. Volunteers from 54

countries arrived to defend the young Spanish Republic. True to their international obligation, the Soviet people gave substantial military aid to the Spanish Republic. Responding to the call of their hearts and in the name of brotherly solidarity, Soviet volunteer fliers went to Spain under the direction of the communist Yakov Vladimirovich Smushkevich. Joining the ranks of the international brigades, they heroically engaged the interventionists, and defended the honor, freedom, and independence of the Spanish peoples. The workers of the Soviet Union armed their sons with their own Soviet I-16 and I-15 fighters, the best fighters of the day, the SB bombers, etc. Soviet military fliers along with those from other countries successfully repulsed attacks made by the numerically superior fascists aviation against the troops and civilian populace of the Republic, and carried out bombing and assault strikes against the troops and equipment of the interventionists. In these battles, the following men were especially outstanding: N. F. Balanov, G. M. Prokof'yev, I. I. Proskurov, P. V. Rychagov, A. K. Serov, G. I. Tkhor, V. S. Khol'zunov, M. N. Yakushin and many others. In all, 141 aviators fought in Spain [80]. /69

G. I. Tkhor

The Soviet volunteers exerted great efforts to train flight and support personnel from the number of their Spanish comrades. They served as assistants to the Republican Command in handling the combat operations of the aviation. In carrying out these tasks, important roles were played by Ya. V. Smushkevich, F. A. Agal'tsov, B. F. Shveshnikov et al. The Communist Party and the Soviet government highly praised the military services carried out by the volunteers, and awarded them the Orders of the Soviet Union, as well as awarding the more distinguished of them with the title Hero of the Soviet Union.

Soviet fliers lent no less aid to the Chinese peoples in their just battles against the Japanese invaders. Stepan Pavlovich Suprun, the son of an Ukrainian people's deputy to the Supreme Soviet of the USSR and a fighter pilot, bravely fought in the skies over China. Along with a group of his friends, he bravely battled the Japanese aerial aces. For his heroism and courage in battle, S. P. Suprun was awarded the high honor of Hero of the Soviet Union.

At the end of July 1938, after meticulous preparations, the Japanese imperialists encroached upon the borders of our homeland in the region of Lake Khasan. They managed to work their way four kilometers deep into our territory. Units from the First Separate Red-Banner Army received the order to, in cooperation with our aviation, destroy the Japanese troops and liberate the territory they had occupied. The Soviet Command ordered 70 fighters and 180 bombers, including 60 TB-3 heavy bombers, into action.

The battles at Lake Khasan lasted 12 days. The enemy, having lost up to three thousand dead and wounded, was driven off Soviet territory. /70

S. P. Suprun

Our fliers played a significant role in routing the enemy. In responding to the call of their homeland, they flew accurate bombing and assault runs against the enemy. An especially heavy strike was carried out on 6 August -- the day on which began the assault of Zaozernaya Hill. Prior to the attack, there was intense aviation "prepping", during which the enemy suffered heavy losses in both personnel and equipment. At dawn our Air Force delivered a heavy strike. This was essentially the first instance in the history of the Soviet Air Force of a massed aviation strike against an enemy. Taking advantage of our aviation's operation, Soviet troops occupied the Zaozernaya Hill on the morning of 7 August.

The lesson which the Japanese invaders learned at Lake Khasan did not, however, satisfy them. In May of 1939 they launched a new provocation, this time assaulting our friendly neighbor the Mongolian People's Republic, in the region of the river Khalkhin-Gol. True to its obligations to its allies, the Soviet Union sent military aid to the Mongolian people.

At the time of the intrusion by the Japanese troops, Soviet aviation based on the territory of the Mongolian People's Republic included one mixed and one fighter wing with the contingent of 82 aircraft. At this time the enemy had 52 aircraft.

At the last instant, both sides substantially increased the number of their aircraft. To reinforce Soviet aircraft in the Mongolian People's Republic, several wings of bombers and fighters were brought in as well as a large group of support personnel, who were outstanding in their combat and political training. In particular, on 29 May the High Commander for Aviation, Hero of the Soviet Union Ya. V. Smushkevich arrived in Mongolia with a group of fliers experienced in battle from both Spain and China. As a result of these measures, by 20 August the aviation grouping of Soviet and Mongolian troops consisted of 515 aircraft, of which 311 were fighters and 204 bombers, /71 against 303 enemy aircraft. All the Soviet and Mongolian aircraft were united into the Air Force of the First Army group (commanded by Brigade Commander A. I. Gusev, with regimental commissar I. T. Chernychev as military commissar, and A. Z. Ustinov as headquarters commander).

By the end of June, fierce fighting had broken out for air superiority. The enemy aircraft attempted to bomb the Soviet and Mongolian troops on the field of battle and fly strikes against our aerodromes. On 22 June, 120 enemy

A. K. Serov

aircraft violated the borders of the Mongolian People's Republic and made the first heavy assault against Soviet and Mongolian troops. To repulse this thrust, we put 95 fighters into the air. In the ensuing aerial battle, which lasted approximately two and a half hours, 31 enemy aircraft were downed [81]. Our losses numbered only 11 fighters.

The aerial encounters took place daily. And in each of them, the Soviet fliers displayed unparalleled examples of bravery, heroism, and mutual assistance. Here is one such combat episode.

On 26 June, in the region of Lake Buir-Nur, a dogfight broke out in which 60 Japanese and 50 Soviet fighters took part [82]. This battle lasted almost two hours, and the victorious Soviet fliers, who had downed 25 Japanese fighters, had lost only two of their own. One of those downed in this battle over the enemy territory was the commander of the Seventieth Fighter Air Wing Major V. N. Zabaluyev, who ejected himself by parachute and landed 30 km behind the enemy lines. The Japanese fighters attempted to shoot down the Soviet flier as he descended with his parachute. However, Major S. I. Gritsevets, who along with /72 his comrades in arms had been swiftly attacking the Japanese fighters, came to the rescue of his commander. Then Gritsevets landed close to his commander, picked him up in his single-seat aircraft, and before the eyes of the rapidly approaching Japanese soldiers, took off into the air. For this and many other heroic actions, Major S. I. Gritsevets was awarded his second Gold Star as Hero of the Soviet Union by order of the Presidium of the Supreme Soviet of the USSR.

In addition to defeating the enemy aircraft in the air, the Soviet fighters flew strikes against the Japanese airfields. In these operations, especially outstanding was the Twenty Second Fighter Air Wing under the command of Hero of the Soviet Union Major G. P. Kravchenko. Thus, on 29 July, a group consisting of 27 and 10 I-16 aircraft headed by Kravchenko successively made two strikes against enemy airfields. As a result of these actions, ten enemy aircraft were destroyed on the field and two were shot down.

In all, from 22 May to 19 August, Soviet fliers destroyed 355 enemy aircraft, 320 of which were downed in aerial engagements. Our aircraft achieved air superiority and rigorously maintained it until the end of military actions. This was one of the prime reasons for the successful offensive operations of the Soviet and Mongolian troops, which began on 20 August after heavy artillery and air "prepping."

Before the offensive, 150 SB bombers covered by 140 fighters flew a massive assault against troop concentrations, artillery positions, and enemy

fortifications in the field of battle. Fifteen minutes before the end of the artillery prepping, a new group consisting of 52 SB bombers covered by 167 fighters again attacked the same targets. During the second strike, at 0900 hrs, ground troops launched their offensive. The massed air attack substantially aided the troops of the First Army Group to successfully smash the enemy defenses.

The next day, the Air Force supported the advancing troops by flying strikes against the enemy's troops and equipment both on the battlefield and behind his lines. This mission was successfully carried out by both fighters and bombers. Thus, for example, on the first day of the operation, fighters flew 175 sorties against enemy troops in the form of assault operations.

When the Soviet and Mongolian troops took the offensive, the Japanese aviation became more active. Fierce fighting resumed in the air with renewed force. Thus, on 21 August five aerial battles were fought. The most intense, lasting approximately one hour, took place when a Japanese assault was repulsed at the airfield in the region of Tantsak-Bulak. In this battle 50 /73 enemy bombers and 40 enemy fighters engaged 150 Soviet fighters. The battle ended in victory for the Soviet fliers, who had downed 15 enemy aircraft.

Our fighters' active operations foiled the enemy's intentions. This aviation could not achieve a decisive influence against the advancing Soviet and Mongolian forces. The Soviet aircraft firmly maintained their air superiority, a vital condition for successfully carrying out the offensive.

With the enemy defeated on the ground and in the air, units of the Red Army successfully engaged in battle on the Khalkhin-Gol river.

From 20 August to 16 September, the enemy lost a total of over 290 aircraft, 270 of which had been downed by Soviet fliers in aerial battles Losses to Soviet aviation at that time amounted to 34 aircraft, i.e., one ninth of the enemy losses.

These aerial battles were the first to see the use of fighters armed with rocket missiles. A group of five of our brave fliers headed by Major N. I. Zvonarev, skillfully using this formidable new weapon, inflicted heavy damage against the enemy. The first combat application of aircraft-borne rockets was successful. The new weapon sowed panic among the ranks of the Japanese fliers.

An important role in the battles at Khalkhin-Gol river was played by bomber aviation. Over 80% of all its sorties were flown with the object of destroying enemy troops and equipment on the battlefield and as deep as possible into his defenses.

Soviet bomber aviation engaged in combat actions not only during the day, but at night as well, to which end the obsolete TB-3 aircraft were used. The object of night flights was primarily to wear out the enemy troops on the battlefield.

Soviet fliers and aerial navigators demonstrated great heroism in the skies over Mongolia. And unparalleled heroic feat was accomplished by battalion commissar M. A. Yuyukin, commissar of the One Hundred Fiftieth Bomber Air Wing. His aircraft was set afire over the target by enemy aircraft fire as he was flying a combat mission. Preferring heroic death to disgraceful capture, the communist flier put his flaming aircraft into a steep dive and crashed into a concentration of Japanese troops. At the cost of his life, he rought heavy damage against the enemy.

Fighter pilot First Lieutenant V. S. Skobarikhin downed a Japanese fighter in an aerial dual by ramming the enemy aircraft and, in so doing, saved the life of his comrade. Major G. P. Kravchenko was another heroic combattant. His feats were highly praised by the Party and government. He was awarded the second Gold Star of Hero of the Soviet Union.

Ye. S. Ptukhin

Captain I. S. Polbin begin his combat career as commander of the air group of the One Hundred Fiftieth bomber air wing on the banks of the Khalkhin-Gol river. Energetic, resolute, he impressed himself upon his subordinates by his personal example. In dealing the enemy terrible damage, Ivan Polbin's air group suffered not the loss of one aircraft throughout the period of combat action. For his bravery and valor, I. S. Polbin was awarded the highest honor -- the Order of Lenin. /74

For their feats in the air at the Khalkhin-Gol river, 60 Soviet fliers were awarded the high honor of Hero of the Soviet Union by decree of the Presidium of the Supreme Soviet of the USSR, [83] and three of them -- S. I. Gritsevets, G. P. Kravchenko and Ya. V. Smushkevich -- were awarded, for the first time in our country, a second Gold Star as Hero of the Soviet Union.

Many fliers, aerial navigators, gunners, radio operators, and engineers as well as other specialists were awarded orders and medals of the Soviet Union and the Mongolian People's Republic.

Hardly had the conflict ceased to resound across the steps of Mongolia when the Soviet-Finnish war begin.

The Air Force from the region of the Leningrad Military District (commanded by Ye. S. Ptukhin, with P. A. Silant'yev as wing commissar and brigade commander A. A. Novikov as chief of staff) took part in this war along with the Red Banner Baltic Fleet. Combat activities carried out by the aviation here were on a broader scale than they had been at the Khalkhin-Gol river. The Soviet fighters were forced to fight under the extremely bad weather conditions of a severe winter, in frost of 40° or below, low cloud cover, and partial snowfall and storms. However, in spite of these difficulties, our fighters

made over 84,000 sorties during the period of combat action, 75% of which were during February to March, i.e., the period of the decisive assault on the fortified regions [84]. In destroying the enemy's long-time defensive arrangements, his troops and equipment, our aviation facilitated the advance of our ground troops deep into the enemy defense. /75

To operate under the adverse weather conditions, the Eighty Fifth Air Wing under Brigade Commander B. V. Sterligov was specially formed. The wing aircraft were equipped for blind landing. During flights in adverse weather conditions, radio navigation was widely used. It was in this air wing that the service of ground support of aircraft guidance, which was later to receive such broad application, was borne.

The Communist Party and the Soviet government highly regarded the military achievements of the Soviet aviators. For their exemplary fulfillment of combat missions at the front and for the valor and bravery thus manifested, a decree by the Presidium of the Supreme Soviet of the USSR awarded the Red Banner to one air brigade, 12 air wings, and two separate air groups [85]. Hundreds of fliers, navigators, gunner-radio operators, technicians and other specialists were awarded orders and medals of the Soviet Union, and 68 of the bravest were given the highest honor of Hero of the Soviet Union,[86] while one of these -- Corps Commander S. P. Denisov was awarded the second Gold Star of Hero of the Soviet Union.

Comradeship and mutual aid in battle had been the distinguishing characteristics of our aviators. During the period of battle in Finland, 11 cases were recorded in which, before the eyes of the Finnish troops, our fliers carried away their comrades-in-arms who had had to make forced landings on enemy territory [87]. One such feat was told in the Army newspaper "Leninskiy put'" of 5 February 1940.

On 1 February 1940, four crews in R-5 aircraft commanded by Captain A. S. Topaller were issued commands to deliver ammunition and supplies to our infantry units which were surrounded. The flight was carried out under the most adverse weather circumstances and at low altitude. Behind the front line, enemy antiaircraft batteries shot out the motor on Topaller's aircraft, and the Soviet flier made a forced landing on a small lake where enemy troops were stationed. Noticing the Soviet aircraft, the Finnish soldiers rushed up to it. However, his comrades-in-arms came to the aid of their commander. First Lieutenant A. Ye. Letuchiy immediately made a landing and taxied up next to Topaller's aircraft. The other two members of the team, circling above, forestalled White Finnish attempts to reach their comrades on the ground through machine-gun fire attack.

Having secured his comrades, Letuchiy began his takeoff run, but his aircraft could not move from the spot: his skis had frozen to the ice. At the price of a tremendous effort on the part of the crew members, the frozen skis were nevertheless broken free and the takeoff was made. Their comrade's life had been saved. For this and other feats performed by A. Ye. Letuchiy and A. S. Topaller, they were awarded the high honor of Hero of the Soviet Union. /76

Soviet aviation actively participated in the defense of the borders of our homeland and was of great aid to the Mongolian People's Republic, Spain, and China, in their just battles against imperialist aggressors. The combat experience acquired during these battles with the invaders was used to improve the combat and operative training of our aviation units in the subsequent pre-war year, as well as to further improve our aviation technology and the organizational structure of the Air Force.

The Eve of the Second World War

The assault by fascist Germany against Poland on 1 September 1939 launched the beginning of the Second World War. In the face of increasing threats against our country made by the fascist state, the Communist Party and Soviet government were forced to take decisive steps toward the further strengthening of the defensive strength of the Soviet state.

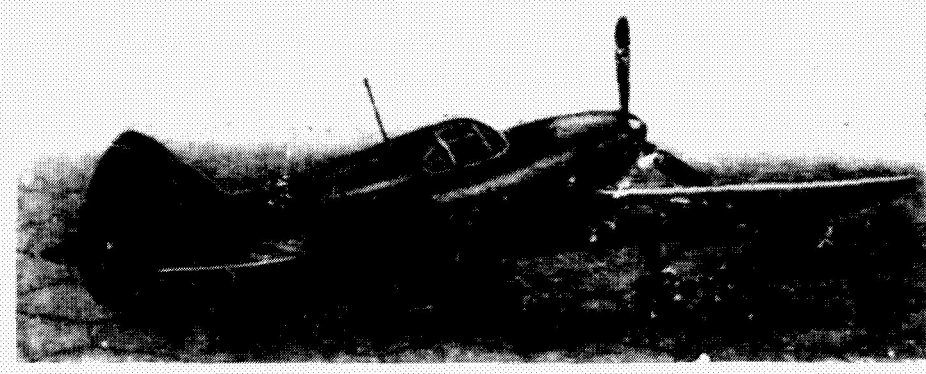
The third Five-Year Plan for the development of the economy of the USSR, as initiated at the XVIII Party Congress, had foreseen the rapid growth of the aviation, tank, chemical and other branches of military industry. As early as 1940, aircraft factories in the USSR were turning out military aircraft at a rate exceeding that of 1939 by 19% [88].

The question of the qualitative improvement of our aircraft pools was brought to the foreground. The aircraft at the command of the Soviet Air Force were substantially obsolete. In mechanical and flying characteristics, they had fallen behind the comparable aircraft of our probable enemies and did not answer the new demands for waging war. On this basis, the Central Committee of the All-Union Communist Party demanded the development of new types of aircraft with higher mechanical and flying characteristics and ordered that they be put into production as fast as possible. In carrying out the Party's directive, the aviation design bureaus created new types of aircraft: the Yak-1 fighter designed by A. S. Yakovlev, the Lagg-3 designed by S. A. Lavochkin, V. P. Gorbunov and M. I. Gudkov, the Mig-1 and Mig-3 designed by A. I. Mikoyan and M. I. Gurevich; the Pe-2 and TB-7 bombers designed by V. M. Petlyakov; and the Il-2 assault plane designed by S. V. Ilyushin. /77

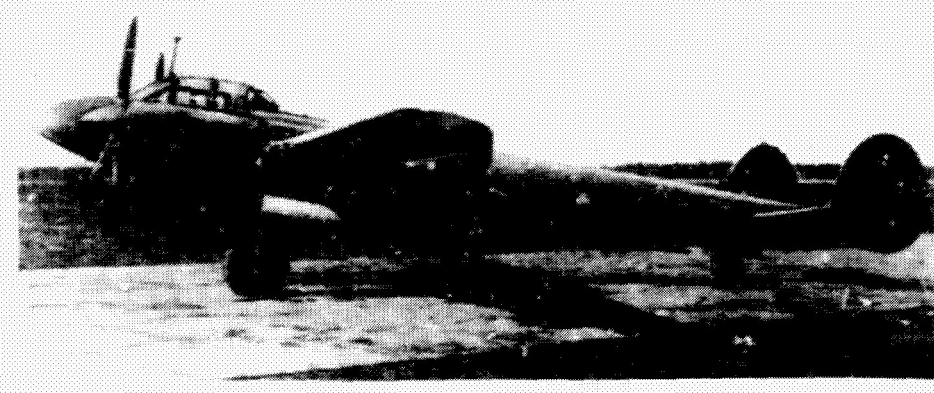
Most of this type aircraft not only were not behind, but in many respects even surpassed this same type aircraft from Nazi Germany. Thus, for example, the Yak-1 had a top speed of 577 km/hr at an altitude of 5,000 meters, and gained this altitude in 5.7 minutes. At the same time, the basic German fighter the Me-109E had a speed of 546 km/hr at this altitude and took 6.3 minutes to reach it.

Soviet aircraft designers created the armored Il-2 assault aircraft, which was armed with two 20-mm caliber cannon and two machine guns, and could carry eight rocket missiles or 600 kg of bombs. Throughout the war, not one capitalist country had a comparable aircraft. /78

The speed of the Pe-2 dive bomber surpassed that of the comparable German Ju-88 by 100 kilometers.



Lagg-3 Fighter



Pe-2 Dive Bomber

Upon instructions from the Party and government, Soviet designers, engineers, and technicians continued working on the creation of pilotless radio-controlled aircraft or, as they were then called, remote-controlled aircraft. In 1939 tests were made on the TB-1 radio-controlled aircraft, and in April of 1941 the TB-3 was tested [89]. These aircraft performed takeoffs, routed flight, and landing by commands givenover radio from a ground control point or from a special aircraft. At the beginning of the war, the Soviet Air Force had several such aircraft.

Soviet scientists and designers developed new types of machine guns, cannon, and navigational and piloting instrumentation. In particular, we put into serial production the 20-mm cannon designed by B. G. Shpital'nyy, S. V. Vladimirov, and I. A. Komaritskiy, the large-caliber 12.7 mm machine gun designed by N. Ye. Berezin, etc. In June of 1939 we adopted as equipment the SPN-3 line-landing system, and in August of the same year readopted the RPK-1 and RPK-2 fixed-loop radio compass [90].

In 1940, our industry began turning out new types of aircraft and other pieces of aviation equipment. During the year, the Air Force received 20 Mig-3 aircraft, 64 Yak-1 aircraft, and two Pe-2 aircraft [91]. Mass production of new types of aircraft began by 1941.

Concerned over strengthening our aviation, the Central Committee of the All-Union Communist Party and the Council of Peoples' Commissars of the USSR passed resolutions (in November of 1940 and February of 1941)[92] which foresaw the future expansion of the number of air units and large units, improvement in the training of our aviation cadre, and the reorganization of Air Force support facilities. It was anticipated that these measures would be essentially carried out by the second half of 1941 and fully carried out by the end of the year and early into 1942.

The Party's broad program in strengthening our aviation was carried out by workers, engineers, and technicians in the aircraft industry, and the entire personnel of the Air Force. Their intense work bore fruit. By spring of 1941 the number of aircraft in the Air Force had more than doubled by comparison /79
with early 1939, and the number of air wings had increased by 80% [93]. At the same time, the strike capability of the Air Force increased substantially as a result of an expansion in our bomber aviation.

In connection with the rapid rate of growth of our aviation, a broad expansion was required in the scope of training of flight and support personnel. The number of aviation training institutions was increased, and the order of their recruiting was changed.

According to the resolution passed by the Central Committee of the All-Union Communist Party and the Council of Peoples' Commissars of the USSR in December of 1940, instead of the volunteer principle for recruiting for the schools and institutions, we introduced a new order for selecting students -- based on scheduled drafting of young men into the Army. In this system it was established that, after graduating from school, the pilots, gunners, bombardiers and aviation mechanics were awarded the rank of sergeant and would continue specified periods of service. Any flight or support personnel up to and including flight commander who had not spent four years in the Army could be switched to barracks duty.

All these steps were aimed at training flight and support reserves in the case of war and increasing the combat readiness of our air units and commands.

Along with this, as practice had indicated, a new method for fulfilling service in the aviation did not seem justified. Therefore, the students who had graduated from flight schools by the onset of the Second World War were immediately awarded officer ranks.

According to a decree issued by the Central Committee of the All-Union Communist Party and the Council of Peoples' Commissars of the USSR dated 25 February 1941, a new system for training flight and support personnel was established for both peace and wartime. Three types of schools were established for training fliers: basic training schools, combat fliers schools, and combat aviation institutions for command pilots. For each type of school we established a schedule of study for both war and peacetime.

The Party and government paid specially close attention to training aviation crews with higher military study. In March of 1940 the Military Academy for Command and Navigational Personnel of the Air Force of the Workers' and Peasants' Red Army, now the Red-Banner Military Air Academy, was created. It was to play a vital role in training command and navigational crews with higher qualifications. Its graduates fought valiantly on the fronts during the Second World War, commanding air units and large units.

In March of 1941 the Military Engineer Academy, subsequently named in honor of A. F. Mozhaeskiy, was created in Leningrad.

Thus, by the beginning of the war we had created three academies for training Air Force crews with higher military educations. /80

Along with this, the Central Committee gave special significance to the training of political workers with higher military training for the air units. With this in mind, an Air Force Department was created in the Military Political Academy imeni V. I. Lenin which was staffed primarily with the best fliers and navigators from the line units, who had proven themselves in practical Party and political work.

During the pre-war years, the Communist Party had waged a great struggle to inculcate in the personnel of air units and large units high morale and combat qualities: love of country, unrestricted devotion to the Party and the Soviet people, readiness to defend the accomplishments of the Great October Revolution, high vigilance and discipline, steadfastness and valor, hatred toward the imperialist aggressors, and outstanding flight and engineering preparedness. The resolution of these tasks was an integral part of all the Party's political work carried on by aviation commanders and political organizers, and Party and communist youth organizations.

A representative trait of Party political work during the pre-war years was also that of increasing the role of commanders in all the educational work and the strengthening of one-man management.

On 12 August 1940 the Presidium of the Supreme Soviet of the USSR issued the decree "On Strengthening Single Management in the Red Army and Navy." In response to this decree, the Institute of Military Commissars, which had been introduced in May of 1937, was abolished. In small, medium and large units, the responsibilities of the assistant commissars in political affairs were strengthened. This measure played a significant role in increasing the commanders' authority, and strengthening discipline and organization in all combat units, including air units.

In inculcating in our aviators a feeling of Soviet patriotism and a strengthening of personal responsibility for carrying out their debts to their homeland, a new text on Military Allegiance, ratified by the Presidium of the Supreme Soviet of the USSR on 3 January 1939, was of great significance. This text was adhered to and subscribed to by each flier, ground crew member, engine mechanic, or other aviation specialists individually on 23 February 1939 during a solemn ceremony before other crew members.

The idealogical and political education of aviators continued on the basis of the historic decisions of the XVIII Party Congress (1939) and the XVIII Party Conference (1940). The history of the All-Union Communist Party, and the international and internal situation of the country and the Party's politics were deeply studied.

First Heroes of the Soviet Union, Awarded This Rank for Rescuing the Men at Chelyuskin in 1934, Left to right: N. P. Kaminin, M. T. Slepnev, V. D. Doronin, V. S. Molskov, M. V. Vodop'yanov, S. A. Levanevskiy and A. V. Lyapidevskiy.

Special attention was paid to obtaining new materiel in achieving mechanical and flying preparation. /81

In 1941 we began reequipping our air wings and reinstructing our flight and support personnel on the basis of new materiel. The reschooling took place both in the lying units and in specially created training centers and schools. In 1941, three reserve air wings were formed to which the reschooled fliers were sent. At the same time, there was formation of new air units and large units. They were staffed by the leading command cadre based on the flight and support personnel at that time in the air wings and divisions. Nevertheless, by the beginning of the Second World War the plan for rearming and retraining our flight personnel had not been completed. The industry had only begun serial production of the new types of aircraft. In the first half of 1941, 1,946 type Mig-3, Lagg-3, and Yak-1 aircraft; 458 Pe-2 bombers, and 249 Il-2 assault aircraft had been produced [94]. However, even all of these aircraft did not reach our combat units. The war caught our armed forces in a state of rearmament. In our units, up to 80% of all aircraft were obsolete, while our new types of aircraft which had just arrived from the factories were still not fitted with flight crews.

Crew of the ANT-25 (left to right): Heroes of the Soviet Union V. P. Chkalov, A. V. Belyakov and G. F. Baydukov.

Fliers Who Distinguished Themselves during Battle at the Khalkhin-Gol River. Among them were two men who were the first in the Country to be twice awarded the rank of Hero of the Soviet Union (left to right): S. I. Gritsevets (second), G. P. Gravchenko (fifth) and Ya. V. Smushkevich (tenth).

In the basic combat training of our aviation units, we attempted to meet the demands of instructing our troops in concepts necessary for war. This attempt was reflected in the order by the People's Commissar of Defense dated 10 May 1940: "On the combat and political training of troops during summer of /82

V. F. Skobarikhim

1940." and the one dated 10 January 1941: "The task of the combat and political training for 1941 "[95]. Special attention was paid to flight during bad weather and at night.

In our bomber aviation, we worked out strikes in flight and air group personnel in close cooperation with infantry troops. The personnel began to perfect bombing and assault dives. Great work was being carried out in perfecting the new aircraft technology. By January of 1941 the following flights had been taught: bad weather -- 60% of the crews, and night -- 30% of the crews in bomber aviation (exclusive of long-range bombers) [96].

In the pre-war years, substantial changes had taken place in the organizational structure of air units and large units.

In 1938, air wings were created. The air wing, a basic tactical unit in bomber aviation, consisted of five air groups of 12 aircraft each, whereas in the assault and fighter branches it consisted of four groups with 15 aircraft each. The air groups of all branches of aviation consisted of flights of three aircraft each.

The air wings constituted air divisions. These were homogeneous (bomber or fighter) or mixed (consisting of various types of aviation). In the Air Force districts, there were also separate reconnaissance air wings and groups.

In 1940 the Directorate of the Air Armies was disbanded. Long-range bomber aviation armed with the DB-3 and DB-3f was organizationally merged into air corps and individual air divisions. Each air corps with two divisions had more bombers than an air army.

To increase the maneuverability of our air units and large units and give them more reliable materiel and airfield support, the Central Committee and the Council of Peoples' Commissars in February 1941 read the resolution to redesign the structure of the rear areas of our Air Force [97]. A basic drawback in the existing organization of the rear units, as had been manifested by experience in combat and operational training and especially the experience of the Russian-Finnish War, was that the units were merged into forming large Air Force units. This organization was applicable during peacetime, when the /83

air units would be based at airfields for relatively long periods. However, during wartime maneuvering, when rapid changing of bases -- sometimes over great distances -- was required, such an organization sharply hindered the maneuverability of the Air Force. Therefore, in accordance with the decision made by the Party and government, air rear-area units were removed from the direct authority of the large air units. These rear-area units were organized on a territorial principle. In the military districts, regional air bases such as the basic rear-area large air units, which were under the authority of the Air Force District Rear-Area Commander, were created. For each region of air bases, tasks were assigned in maintaining the territory and the materiel and equipment support of the air units based on airfields within the region. The regional air bases included air bases at the rate of one per air division. To service the air wings, battalions of airfields supply at the rate of one battalion per wing were created at the air bases.

Oath of the Guards

During the last pre-war months, great strides were taken in carrying out the Party and government's resolution. However, because of the time restrictions, it became impossible to fully carry out the restructuring of the Air Force rear areas. What was accomplished, however, substantially increased the maneuverability of our air units.

As was shown by experienced gained during the war, the new organization of the Air Force rear areas just about fully justified itself. During the war years, only one interim element in the supply chain was eliminated -- that of the air base.

To achieve satisfactory basing of our air units in our western border

districts, in the spring of 1941 the structure of most of the new airfields was revised. The schedule for completing this revision was the second half of 1941. Naturally, with the beginning of the war we were not able to create the needed airfield network, which resulted in conjested basing of air units in the western border districts.

As was made known later, of the five air fleets which existed in Germany, the enemy concentrated four for the assault against our country. In numbers, these fleets had over 3,900 German and up to 1,000 Finnish and Romanian aircraft [98].

M. P. Zhukov, S. I. Zdorovtsev and P. T. Kharitonov (left to right), First to be Awarded the Rank of Hero of the Soviet Union during the Second World War.

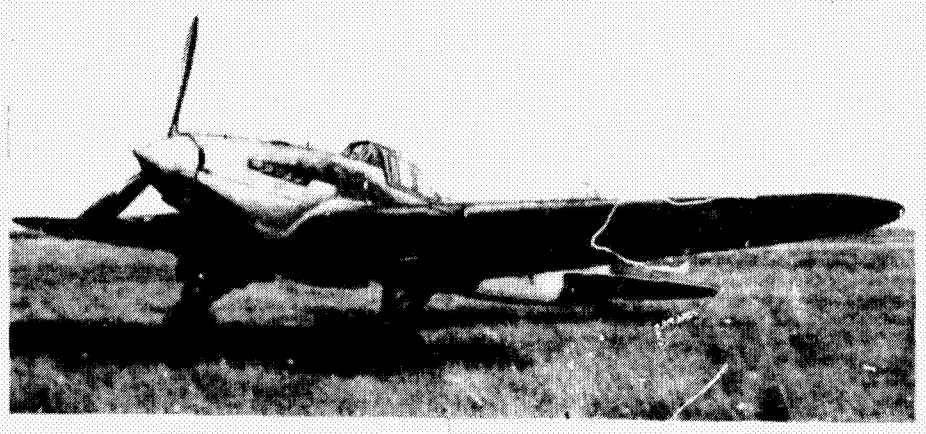
Like his ground troops, the enemy's aviation units and command had been brought up to full combat readiness and only waited the signal to begin their treacherous assault. /84

In spite of a nonaggression pact concluded with Nazi Germany in 1939, the Soviet government nevertheless considered it possible that war would be unleashed against the USSR. To repulse possible aggression, substantial air forces were concentrated along our western borders to complement our ground troops; these air forces included the Leningrad, Baltic, Western, Kiev and Odessa Special Military Districts. The aviation grouping of WEstern border districts equalled and, with respect to long-range bomber aircraft even surpassed the air strength of Nazi Germany and its satellites which were concentrated at our western borders.

The enemy's strongest air grouping was that of his Second Air Fleet (1,670 aircraft), which was aimed at supporting his "Center" army group, which had advanced along the western Special Military district.

On Guard in the Sky over the Capitol.

Left to right: A. N. Katrich, Second in Command of the Twenty Seventh Fighter Air Wing; Group Commander Captain F. S. Chuykin; Wing Commander Major V. A. Ivanov, and Air Fleet Service Battalion Commander Lieutenant Colonel I. P. Kudinov (at Captain Katrich's aircraft). 1942.



The Il-2

By the beginning of the war, the Air Force in the western Special military district, along with the long-range bomber air corps based there, totalled 1,825 aircraft [99]. Thus, we had a numberical superiority of 1.1 on the western front. However, with respect to the number of combat-ready aircraft and crews standing ready in the air wings, the Soviet Air Force was substantially behind the enemy.

A small number of combat-ready crews within the ranks of the air wings had, before all else, made it clear that the process of rearming with new types of aircraft was taking place. The new materiel within the military district started arriving mainly only in April-May of 1941.

The two pre-war years were insufficient to work out the problem of combat readiness with the new materiel. As a result, our air wings armed with the new aircraft had few combat-ready crews. In addition, several air wings had materiel which was still not usable.

As a result, in contrast to the Nazi air units, our Air Force along our border military districts had a substantial number of both aircraft and crews which were not combat ready. For example, on 22 June 1941 in the western Special military district, a total of only 1,086 aircraft, including the long-range air corps, i.e., around 60% of our total number of aircraft, were prepared to take to the air to engage in combat [100]. The remaining aircraft either had no combat-ready crews, or were themselves not ready for flight. Because of this, by the beginning of the war the enemy had a 1.5-fold superiority with respect to combat-ready crews and aircraft along our western front. /85

Our air units and large units along our border military districts were continuing their peacetime activity on 21 June 1941.

Thus, the Central Committee of our Party and the Soviet government, in considering the growing possibility of armed invasion of our country by Nazi Germany, was in the process of taking several vital measures with respect to strengthening our Air Force. The number of Soviet aircraft had been increased,

the quality of our aircraft was improving, and our combat training was being modernized. Our Air Force had flight and support personnel, command and political cadre who were well trained and dedicated to their Soviet homeland.

The high morale and combat levels existing in our flight and support personnel and Air Force commanders, who had been trained by the Party, were most highly manifested during the trying years of the Second World War.

CHAPTER 4

SOVIET AVIATION DURING THE SECOND WORLD WAR 1941-1945

ABSTRACT. A detailed history of Soviet air operations throughout the second world war is presented. Particular attention is given to the air defense of Moscow. Operations of the Soviet Air Force in support of the offensive after the German advance was halted are described.

Early in the War

At dawn on 22 June 1941, the peaceful life of the Soviet peoples was ripped apart by the thunder of gun salvos, the howl of sirens, and the explosions of bombs and shells. In the cloudless sky, suddenly there appeared thousands of bombers with black crosses on their wings. They dropped tons of deadly metal on many of our cities and villages, airfields and railroad stations, naval bases and ports, headquarters and communication centers. At the same time, along our frontier posts German artillery opened up withering fire against our covering troops and defensive fortifications. The Nazi German Army, numbering in the millions, previously mobilized and concentrated at our borders, and armed to the teeth with combat equipment, intruded into the territory of the USSR and launched an assault in the most important strategic directions, persuing its goal of overwhelming the Red Army as fast as possible, destroying the Soviet government, enslaving the Soviet people, and usurping the economic riches of our country. /86

The Soviet people had to seize its weapons in order to defeat the enemy, and uphold the honor and independence of its land. From Barentsev to the Black Sea, fierce struggles broke out, the like of which history had never seen. Thus began the Great Patriotic War.[1]

From the very first day of the war, the very intense situation in the air on the Russian-German front became more complex. In struggling to immediately seize air supremacy, the Nazi command threw over 50% of its Air Force,

[1] As it is termed by the Soviets; herein referred to as World War II -- Tr. Note.

concentrated on the Soviet border, in order to destroy our Air Force.

On 22 June, large groups of German bombers launched intensive assaults on 66 of our border airfields, at which were based up to 70% of all the air wings from the Baltic, Western, Kiev, and Odessa Military Districts. At the same time, enemy fighters actively neutralized our means of antiaircraft defense and engaged in battle with our aircraft in the air. /87

Soviet fliers selflessly entered into combat with the fascist air force. In fierce engagements with a crafty and experienced foe, they comported themselves bravely and with maximum concentration of their forces, impressing the world with their unparalleled steadfastness of spirit, unshakable courage, and bravery. The Nazis encountered opposition in the air, the likes of which they had never seen. During the day of 22 June, our Air Force flew almost 6,000 sorties, and downed over 200 German aircraft [101].

On the first day of the Nazi aggression, the fighter air groups of the 127 Fighter Air Wing of the Western Special Military District, commanded by First Lieutenant I. I. Drozdov, took to the air four times to repulse attacks by Nazi bombers near Brest, and returned victorious each time. Five downed Nazi aircraft -- this was the toll of their combat actions on the very first day of the war.

On the southwestern front, the glory of Second Lieutenant D. F. Kovtyulev, a flier in the Ninety First Fighter Air Wing, increased. In 15 days of the war he downed three Nazi aircraft, while a fourth had to make a forced landing behind our lines in the region of Berdichev [102]. In this same region, Second Lieutenant V. A. Knyazev of the 252 Fighter Air Wing was also behaving fiercelessly: on 23 June he downed two Nazi bombers. Both these fliers were subsequently awarded the rank of Hero of the Soviet Union.

At the same southern portion of the German front, the fliers of the Sixty Seventh Fighter Air Wing under the command of V. A. Rudakov were also bravely fulfilling their combat debt. With each passing day the number of combat victories in this wing increased. Starting two weeks after the beginning of the war, in his flight log Lieutenant V. A. Chuyevskiy listed four downed aircraft, Second Lieutenant M. G. Buzhenkov, Lieutenants P. D. Leont'yev, A. Ya. Melent'yev and G. T. Sabachenko each downed three, while Second Lieutenant I. K. Bebenin and Lieutenant N. M. Yermak each downed two enemy aircraft [103].

There were many such examples of bravery and high flight expertees: heroism was widespread. Often, brave Soviet fliers, having exhausted their ammunition during aerial combat, would ram into enemy aircraft to destroy him and prevent him from reaching his target. /88

On 22 June, at 0425 hrs., a flight of fighters from the Fourty Sixth Fighter Wing of the Kiev Special Military District, commanded by First Lieutenant I. I. Ivanov, took off to repulse a flight of German aircraft attempting to fly a strike against the airfield. The enemy had a three-fold numerical superiority, but our brave fliers did not falter. A pitched battle ensued.

P. S. Ryabtsev

Attacks by our red-Starred pursuit planes followed one after the other. Failing in the assault, the Nazi bombers began to drop their bombs haphazardly and retreat to their own territory. One enemy aircraft caught fire in the air and crashed to earth. At this time, our fliers exhausted their ammunition -- they could no longer pursue the enemy. Then the brave commander ordered his subordinates to land, while he himself continued in pursuit of an enemy aircraft and knocked off its tail assembly in a ramming maneuver. The Heinkel, engulfed in flames, broke apart in the air.

This took place at L'vovshchina, not far from the spot where. in 1914, our reknowned countryman P. N. Nesterov flew the world's first aerial ramming against an Austrian observation plane.

On 2 August 1941, First Lieutenant I. I. Ivanov was awarded the Rank of Hero of the Soviet Union.

On the first day of the war, enemy aircraft were also rammed by education and information officer A. S. Danilov, Second Lieutenant D. V. Kokorev, and Lieutenant P. S. Ryabtsev (Western Special Military District Air Force), Second Lieutenant L. G. Butelin (Kiev Special Military District Air Force), and Lieutenant A. I. Moklyak (Odessa Military District Air Force).

However, dispite their valor and selflessness, the Soviet fliers could not change the situation in the air in their favor, because they were forced to fight under conditions of unequal battle. The war had caught the Soviet Air Force in the stage of reorganization and rearmament. Many air units and large units were equipped with the new Yak-1, Mig-3, Lagg-3, Pe-2, and Il-2 aircraft, but these machines had not yet been fully mastered by their flight crews. At the same time, our obsolete fighters and bombers lagged far behind the comparable enemy aircraft in terms of their combat and flight qualities. To make matters even worse, the German Air Force had made full use of the factor of surprise. This is why our Air Force in our border military district could not repulse the enemy's onslaught in our organized manner, and thus suffered tremendous losses of our aircraft. /89

An even more difficult situation took shape in the Western Special Military District. Bomber squadrons of the Second Air Fleet were subjected to a sudden massed strike against 26 airfields housing units of three of our most prepared and combat-ready air divisions for the district, which had been armed with the latest type aircraft. Several airfields close to the border were even struck by artillery.

On the first day of the war, the Ninth Combined Air Division lost 347 of it 409 aircraft, and the Tenth Combined Division lost 180 of its 231. By the

A. S. Danilov

end of the first day of combat action, the Eleventh Combined Division was left with only 72 of its original 199 aircraft in operation. As early as the second day of the war, these three commands of the Western Special Military District were out of combat and had to be reformed.

Fighters for the district took to the air only after the enemy's first assault. In the ensuing aerial combats, our fliers downed more than 100 German aircraft, and had dispersed many groups of German bombers. Nevertheless, they could neither prevent nor limit the actions of the enemy Air Force. In one day the enemy destroued 387 Soviet fighters and 351 bombers [104].

The air force in the Odessa Military District, commanded by General F. G. Michugin, was more able to maintain organized defense against the assault of enemy aircraft. Several days prior to the assault by Nazi Germany, this military district had tested the mobilizational readiness of its troops. The air wings had been secretly shifted to field aerodromes, and had been brought up to increased combat readiness. The aircraft standing at the field had been dispersed and camouflaged. The unit and command headquarters had worked out signals for alerting and assembling the crews in the event of an alarm. From morning to night, flights of fighters were on duty at the airfields. The district Air Force Headquarters, having shifted from Odessa to Tiraspol', had built up both wire and radio communications with division headquarters.

As a result of these measures, the district's Air Force combat readiness had been substantially improved, and the effects of the sudden attack by the enemy was almost nullified. As soon as enemy bombers had crossed the border, our fighters had been alerted and sent into the air. Not anticipating serious resistance, the Nazis flew in large groups in close combat formation, as if on parade, and without fighter cover. In persistant attacks, the Soviet fighter pilots broke the ranks of the bomber columns and downed 30 aircraft during the aerial encounter. The Nazis could bomb only six airfields, at which a few of our aircraft caught fire [105].

This example shows convincingly that where the Air Force's vigilance and combat readiness had been at the level it should have been, the enemy was incapable of catching our air units by surprise. Encountering organized opposition, his aircraft suffered heavy losses.

Intensifying strikes against our aviation, by 10 July 1941 the enemy had put out of commission a substantial percentage of the combat contingent of our Air Force in the Western border district.[1]

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[1]On 22-23 June 1941, the Northern, Northwestern, Western, Southwesters and Southern fronts were created on the basis of the Leningrad, Baltic, Western, Kiev and Odessa Military Districts, respectively.

The high losses suffered by Soviet aviation were explained by the qualitative and quantitative superiority of the enemy's aircraft, the insufficient combat readiness of our Air Force, the meagerness of the supply bases for our air units, for airfield camouflaging, and for antiaircraft defense.

Having inflicted heavy damage to the Soviet Air Force and having secured /91
overwhelming superiority for himself in terms of the number of aircraft, the German Air Force achieved air superiority in the most important sectors of the front. His bomber squadrons seriously hindered efforts by our ground troops, Air Force and Navy in carrying out combat missions, and at times they operated with impunity in the battlefield, launching substantial strikes against objects in our operational areas behind our lines, and barbarically destroying civilian cities and towns. The enemy's achieving air superiority was one of the reasons for the Red Army's failure in defensive operations in the summer and autumn of 1941.

However, even during this most difficult period of the war, the Soviet Air Force continued active operation. The enemy did not manage to fully destroy our Air Force or break our fliers' will to resist. The Nazi command's calculation that their stunning mass strikes against our airfields would fully destroy the Soviet Air Force and thereby free the way for their tank and motorized divisions proved their downfall.

In the first days of the war, only our border districts suffered serious losses in their Air Force. Meanwhile, our High Command and Air Force long-range bomber aviation for the internal districts, based at distances of 300 - 450 km from the frontier, suffered almost no attacks by Nazi aircraft at that time. The enemy did not have a sufficient long-range bomber force to operate behind our lines. In addition, the Soviet Air Force suffered heavy losses only with respect to our aircraft, whereas our flight crews suffered only insignificant losses. The flight crews which had had their aircraft destroyed could be used in the newly forming air wings and divisions. Therefore, the Soviet Air Force, in spite of the difficult air and ground situation, did not lose its combat readiness. From 22 June to 10 July 1941, 45,000 sorties were flown, and more than 10,000 tons of bombs were dropped on the enemy [106].

The rapid Nazi advance deep into our country and our ground troops' lack of firepower to destory him forced the Soviet command to exert its primary efforts (47% of all combat sorties) on engaging tank and motorized divisions. Not only front-line but also long-range bombers, as well as naval aviation along the coast, flew strikes against the enemy's motorized columns and river crossings at the Zapadnaya Dvina, the Neman, the Berezina, the Drut', the Prut, and the Dnestr, as well as against troops in the battlefield. /92

Even in the first days of the war, the flight crews of many of our air units and large units were honored for their high combat expertees and bravery with the gratitude of the war councils of the armies and fronts.

These included the Second Combined Air Division of the Northern Front (commander: Colonel P. P. Arkhangel'skiy), the Fifty Seventh Combined Air Division of the Northwest Front (commander. Colonel K. A. Katichev), the Twelfth, Thirteenth and Fourty Sixth Bomber Division of the Western Front (commanders: Colonel V. I. Aladinskiy, General F. P. Polynin, and Colonel B. R. Pisarskiy), the Sixty Second Bomber Air Division of the Southwestern Front (commander: Colonel V. V. Smirnov), the Twenty First Combined Air Division of the Southern Front (commander: Colonel D. P. Galunov), and many others.

"The command and troops," -- stated a telegram by the War Council of the Ninth Army of the Southern Front dated 30 June 1941, -- "extends its comradely gratitude to the fliers of the Twenty First Combined Air Division and night bomber wing for their active aid in destroying the enemy. Through your outstanding actions the enemy, who has encroached upon the borders of our country, has been so demoralized that he has been forced to make a hasty withdrawal, relentlessly destroyed by our fliers' accurate fire "[107].

The fliers of the Thirty Third and Fifty Second Bomber Air Wings under the command of Colonel F. S. Pushkarev and Lieutenant Colonel I. K. Kosenko fought bravely. On 24 June they inflicted heavy losses against German motorized and mechanized columns in the region of Dubno [108]. The brave fliers of the Fourth Assault Air Wing headed by Major S. G. Get'man also fought skillfully and bravely. On 28 June, their accurate attacks destroyed up to 20 tanks at a river crossing and held up the advance of the column on the Bobruysk-Mogilev road by six hours [109].

However, not all operations by Soviet aviation were as successful and effective. Due to a lack of experience and time to organize the cooperation under the conditions of our Army's rapid withdrawal, strikes by bombers and assault aircraft, as a rule, were poorly coordinated with the actions of defense troops. Instead of concentrating on the most important areas and sectors of the front, our Air Force's efforts would be exerted at scattering, neutralizing and destroying many objects of secondary importance. Very frequently, our means of striking would be poorly selected as well. Against the enemy's tanks and other combat machinery we frequently used small fragmentation bombs, which do not achieve the necessary affect. In addition, assaults would be made against small and narrow targets from high altitudes, which resulted in decreased bombing accuracy. All these faults were negatively reflected in the results of our Air Force's combat actions. /93

Soviet fliers carried on an intense battle with enemy aircraft, which were carrying out massed assaults against our airfields, troops, and other objects. 37.1% of all our combat missions were flown with this object.

In the first three days of the war, the battle with the enemy's aircraft on the German front was carried out primarily in the air. Retaliatory strikes against enemy airfields were not carried out. On 25 June, in accordance with instructions from General Headquarters, the first massed assault was organized against 19 airfields in Finland and northern Norway, where squadrons of the Fifth German Air Force were based. This strike was preceded by aerial reconnaissance, which uncovered large concentrations of enemy aircraft at the

airfields. It was clear to the Soviet command: the Nazis were preparing for an active air operation in the region of Leningrad. To foil the enemy's intentions, it was decided to rout the enemy Air Force by an audacious strike.

Throughout the night of the eve of 25 June, work continued frantically in the air wings of the northern front as well as the Baltic and northern fleets. Every flier, navigator, engineer and mechanic was doing everything he possibly could to best carry out the Command's combat order.

In the morning, as the fog was just breaking, 236 Soviet bombers and 224 front-line fighters and naval aircraft took to the air and headed toward the object of their attacks. The enemy did not anticipate such a bold and daring action, and was caught unaware. Only individual enemy fighters were flying partrols on air alert missions, and they offered no serious resistance. His antiaircraft artillery opened fire after our fliers, having fulfilled their mission, were returning from the targets. At the airfields aircraft were burning, ammunition and fuel dumps were blazing, and bombs and fuel tank cars were exploding, while in the air 11 enemy aircraft were downed. The enemy lost a total of 41 aircraft [110].

On the following days up to 1 July, strikes by Soviet aviation against airfields in Finland took place one after the other. The Nazi Command, in taking count of the loss of its many aircraft, had to shift the remaining forces to rear-area airfields. /94

On 8 July, the Soviet Command organized a massive strike against enemy airfields across a broad front -- from the Baltic to the Black Sea. In an order dated 7 July, the GHQ instructed that: "Combat activity by the Red Army Air Force will begin at 0300 hours on 8 July with a strike against airfields. Fighters, assault aircraft and bombers will destroy the German aircraft at their air bases, and then continue to operate in the battlefield "[111].

The first to take off were 125 long-range bombers which during the night engaged in action against 14 of the enemy's largest base airfields. After them, large units from the Air Force on the northern, northwestern, western and southwestern fronts attacked 28 enemy airfields, flying 304 sorties. As a result of this mass strike, many German aircraft were knocked out of commission. Fliers on the western front alone burned and damaged 54 enemy aircraft [112].

In all, during the period from 22 June to 10 July 1941, the Soviet Air Force destroyed more than 1,000 enemy aircraft at airfields and in the air [113].

"...Losses to the German Air Force were not as insignificant as some thought," -- point out the authors of the book *The 1939-1945 World War* published in West Germany -- "during the first 14 days of battle, even more aircraft were lost than in any subsequent equal time period. From 22 June to 5 July 1941, the German Air Force lost 807 aircraft of all types, whereas during the period 6 to 19 July they lost 477. ...In spite of the surprise achieved by the Germans," -- the authors of this book bitterly acknowledge,

-- "the Russians managed to find the time and strength to inflict substantial retaliation "[114]. It is impossible not to concur with these conclusions!

The Soviet Air Force carried out successful operations against the enemy's military and industrial centers deep behind his lines. On the second day of the war, when the Nazi radio stations were boastfully declaring their "complete victory over the Russian Air Force," 28 crews of the High Command's /95
long-range bomber aviation as well as fliers from the Baltic and Black Sea Naval Air Force were staging assaults against ports and military enterprises in Danzig, Königsberg, and Bucharest. Explosions and fires at oil refineries ship wharfs, and armament ammunition warehouses persuasively refuted the lie by fascists propaganda that the Soviet Air Force had been fully destroyed. In subsequent days, Air Force strikes against important military objects deep behind enemy lines did not cease.

N. F. Gastello

Soviet fliers did not spare their lives in carrying out their combat missions for the sake of victory over the Nazis.

The whole world knows of the immortal feat by the crew of a bomber from the 207th Long-Range Air Wing: Captain N. F. Gastello, Lieutenant A. A. Burdenyuk and G. N. Skorobogatyy and Technical Sergeant A. A. Kalinin. During an attack against an enemy motorized and mechanized column, their aircraft was struck by an antiaircraft artillery shell. A bright tongue of flame flew out from under the wing. It was impossible to continue the flight. Then the fearless Captain Gastello selected their last target. He aimed the flame-engulfed aircraft at a concentration of tanks and fuel tanks. For this feat, Captain N. F. Gastello was posthumously awarded the Rank of Hero of the Soviet Union, while his crew members were posthumously awarded government honors. The name of Captain Gastello is eternally written in the ranks of the N-th wing. Schools, Pioneer Detachments, and villages carry the name of this hero. The feat by the brave pilot and his crew members did a pride to all the Soviet peoples. And how many such heroes there were, who emulated the feat by Gastello's crew!

The just goals of the war inspired the Soviet fighters to new feats, and gave birth to new heroes.

On 8 June 1941, three Soviet fliers from the 158th Fighter Air Wing -- M. P. Zhukov, S. I. Zdorovtsev, and P. T. Kharitonov -- were the first to be /96
awarded the Rank of Hero of the Soviet Union in the Second World War. They earned this high honor during the battle for Leningrad.

An outstanding deed was performed by First Lieutenant P. A. Markuts, flight commander of the Fourty Fourth Bomber Air Wing. On 2 July, he took off for a reconnaissance mission against enemy crossings at the Zapadna Dvina river. At the site where he was to carry out his combat mission, he was attacked by three Nazi fighters. Markuts attempted to avoid battle by flying into the clouds, but he could not manage it. The Nazis were in hot pursuit. The fighters were rapidly closing in on our observation plane, but suddenly the Soviet flier engaged one of them with a precise burst of fire. Suddenly, Markut's aircraft was also hit and he could not continue flight. Having bailed out behind enemy lines, in the woods our flier encountered soldiers from the 749th Infantry Regiment, who were threading their way toward our own troops. Communist Markuts took command of them and avoided the encirclement with them. For his heroism and bravery, Pavel Markuts was awarded the Rank of Hero of the Soviet Union.

During the trying times of the early period of the war, our country was transformed into a united military camp under the direction of the Communist Party. The national economy was put on a war footing. The Armed Forces, including the Air Force, were strengthened and reorganized.

On 23-25 June, the Air Forces of the fronts and armies were created on the basis of the Air Force in the border district. Air Force commanders for the fronts were pointed: on the northern front -- General A. A. Novikov, on the southwest -- General A. P. Ionov and, after 1 July 1941, General T. F. Kutsevalov; on the western front -- General A. I. Tayurskiy and, after 2 July 1941, -- Colonel N. F. Naumenko; on the southwest front -- General Ye. S. Ptukhin and, after 1 July 1941 -- General F. A. Astakhov; and on the southern front -- General F. G. Michugin and, after 27 June 1941 -- General P. S. Shelukhin.

With the object of coordinating the efforts of aviation from combined front-line formations, on 10 July the High Commands were formed for the Air Force on the northwest, west and southwest fronts. The following men were appointed Air Force commanders and chiefs: on the northwest front -- General A. A. Novikov, on the western front -- Colonel N. F. Naumenko and on the southwest front -- General F. Ya. Falaleyev.

On 29 June, the General Headquarters abolished the position of Air Force headquarters chief, and instituted the position of Red Army Air Force Commander, transferring to it the responsibilities of assistant people's commissar of defense. General P. F. Zhigarev was appointed commander of the Red Army Air Force. At the same time, a war council for the Red Army Air Force was formed, and it assumed command of the combat operations of aviation and handled the training of cadr and the creation of aviation reserves. /97

In accordance with a resolution by the Coucil of People's Commissars dated 23 June, the Civil Air Fleet was turned into an operational branch of the commissariat of defense.

NASA

Reserve air wings were created to retrain flight crews to handle the new

equipment and prepare them for combat missions. Deep behind our lines, air units were formed which were destined for the field army.

The Party and government also performed substantial work in evacuating the aircraft industry from the western and eastern regions of the country, and increasing aircraft production. In the second half of 1941, the average monthly output of combat aircraft increased 2.2-fold as compared to the first, pre-war, half-year. The production of new types of aircraft especially increased. The production of Lagg-3 aircraft increased 6-fold, that of Yak-1 and Pe-2 aircraft increased 3-fold, and that of Il-2 aircraft increased 5-fold [115].

Inspired and guided by the Party, the country's Air Force was hardened, fortified, and strengthened.

Displaying high political conscientiousness, whole-hearted devotion, and strong filial love toward the Communist Party, the country's best aviators flew to its ranks during the difficult days of combat trials. In Air Force units, there were increases in the ranks of communists and communist youth, who by their example inspired the soldiers to better fulfill their combat missions.

"Our fliers act heroically. In the Party and political work within air units, basic attention is given to supporting the avant-garde role of the communists and the communist youth in battle"[116] -- as was stated in one report sent back by the political propaganda headquarters of the western front on 3 July 1941.

In the first days of the war, the GHQ and Red Army Air Force Command carried out various measures to eliminate drawbacks in the organization and carrying out of combat missions by our Air Force and increasing the effectiveness of its application. On 3 July 1941, a General Staff Directive was issued concerning the high-altitude and night-time use of High Command long-range bomber aviation, which was equipped with obsolete aircraft, because during day flights it was suffering high losses. To increase the effectiveness of assaults against enemy personnel and equipment, starting with 10 July the Soviet Air Force began using not only fragmentation and demolition bombs and machine gun and cannon fire, but also incendiary weapons. Measures were also /98
taken to widely disperse our aircraft and camouflage the aircraft on the airfields, and to increase air unit vigilance and combat readiness for carrying out combat missions.

Defensive Engagements

Having occupied the greater part of the territory of the Baltic Republics and White Russia and the western regions of Ukraine and Moldavia in the first 18 days of the war, the Nazi troops re-routed their advance toward Leningrad, Smolensk, and Kiev.

The enemy enjoyed an overwhelming numerical superiority with respect to tanks, aircraft, armament and troops. His Air Force had doubled the number

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of aircraft of ours[1] and, maintaining air supremacy, launched substantial attacks against our troops, airfields, and objects in operational areas behind our lines.

The Soviet Air Force carried out combat missions under the most difficult circumstances with respect to the situation both on the ground and in the air. Our aircraft industry could not make up for combat losses, and the number of aircraft in our wings and divisions in the field army decreased three to four-fold. In our air units, there were many crews who had no aircraft. Therefore, many fliers, navigators, and gunner/radio operators, anxious to get into combat, entered the ground troops, where they fought bravely in infantry, tank and artillery units. Our aviation fuel and ammunition supplies along our frontier lines were either destroyed or captured by the enemy. Therefore, the Soviet Air Force was experiencing great difficulty in the materiel and mechanical support of flights. During the conditions of the rapid advance of enemy troops, our air wings had to shift their bases quite frequently, which had a negative effect upon the organization of our Air Force's combat operations.

The enemy's numerical superiority in aircraft was compensated for by our fliers' trebled energy, high degree of flight expertise, fearlessness, and heroism. Acting decisively and bravely, they day and night harried tank columns on the road, destroyed the enemy in the battlefield, destroyed river crossings, and covered our own ground troops from assaults by the German Air Force, helping them maintain defensive positions. Our Air Force flew 46.9% of its combat sorties to destroy Nazi troops.

Our Air Force was of great assistance to ground troops as they carried out counter-offensives. Thus, from 14 to 18 July, troops of the Eleventh Army of the northwest front dealt counter assaults in the region of Sol'tsa, where Nazi tank and motorized divisions were attempting to break through to Leningrad by the shortest route. Engaged in supporting and covering Soviet troops were the Fourth, Sixth, and Fifty Seventh Combined Air Divisions of the northwest front (commanders: Brigade Commander A. N. Sokolov and Colonels B. A. Sidnev and K. A. Katichev), the Second Combined Air Division of the northern front (commander: Colonel P. P. Arkhangelskiy), and the First Long-Range Bomber Air Corps (commander: Colonel V. I. Izotov) -- a total of 235 aircraft. /99

Several hours prior to the onset of the counter offensive, the Soviet fliers attacked tanks, guns and troop concentrations as well as reserves being brought up from the rear in the region west of Sol'tsa, Sitnya, Porkhov, and Dno. Many guns and mortars were blown into the air, and two railroad echelons, in which the Nazis had been bringing up reinforcements from the rear, were destroyed.

The Soviet Air Force fought especially intensely during the

[1] In terms of the situation as of 10 July 1941, the enemy had approximately 5,000 aircraft on the German-Russian front, whereas our field army front-line aviation had 2,516, of which 638 were not serviceable. (Arkhiv MO SSSR, Vol. 35, No. 30802 Sec. 19, pp. 22-24).

counteroffensive by our troops. Although there were dozens of Nazi fighters in the air, our bombers and assault aircraft constantly flew strikes against enemy tanks and troops, inflicting heavy damage. On 17 July alone, they burned and damaged 30 tanks and 20 motor vehicles.

The success of our bombers was facilitated by our fighters who, engaging enemy fighters in battle, destroyed 18 German Junkers aircraft [117].

The then chief of the General Staff of German ground troops, General Halder, at that time noted in his diary: "The enemy aviation is displaying great activity, he is carrying out raids against units in Reinhardt's corps and against our ground divisions... In general, during actions the enemy aviation demonstrates firm and purposeful direction" [118].

In four days of battle, our ground troops, actively supported by aviation, destroyed the enemy's Eighth Tank Division in the region of Sol'tsa. The survivors, saving themselves by fleeing, retreated 40 kilometers to the west.

Soviet fliers performed equally successfully in supporting the counter-offensive by the troops on the western front, carried out in the region of Smolensk from 23 to 25 July.

On the eve of the counteroffensive, aviation units on the western front /100
and partially those of the reserve front (commanded by Air Force General B. A. Pogrebov) struck the enemy airfields at Ulla, Beshenkovichi, Krupki, Pukhovichi, Vilno, and Osipovichi with the object of weakening the enemy's aerial groupings. To carry out this mission, 138 sorties were flown. At the same time, railroad echelons were attacked at the Orsha and Vitebsk stations, and motorized and mechanized columns were attacked on the move.

On the morning of 23 July, when our infantry divisions, accompanied by tanks, launched the offensive, small groups of bombers and assault aircraft literally hung suspended over the battlefield, destroying the enemy's fire-power directly in front of our attacking troops. The fliers of the 150th Bomber Wing commanded by Major I. S. Polbin were especially successful. In three or four approaches to the target, they neatly destroyed the enemy's tanks and troops.

The chief of the Nazi General Staff, General Halder, wrote in his official diary at that time: "Enemy air activity is increasing at the front of groups of our 'Center' Armies, which in many units is causing serious difficulties "[119].

As a result of the counteroffensive by troops on the western front, the enemy suffered substantial losses. The situation for our troops, who had engaged in violent defensive battles in the Smolensk region, substantially improved. In three days, the fliers in the western front Air Force alone flew 875 missions and destroyed dozens of tanks, guns, and trucks with troops. The Nazis lost 32 aircraft in aerial encounters. Our losses were 27 aircraft [120].

Toward Smolensk, the fliers of the 401st Fighter Air Wing commanded by the

renowned fighter pilot and Hero of the Soviet Union Lieutenant Colonel S. P. Suprun fought selflessly. Daily, they went into battle against the German bombers. The count of aircraft which they downed continually rose. Lieutenant Colonel Suprun fell to his heroic death in one of these aerial encounters. On 22 July 1941, he was the first to be awarded the second Gold Star Medal in the Second World War as a result of his high combat skill, bravery and courage, as demonstrated battle with the enemy.

Our Air Force took an active part in supporting the counter strike by our troops on the western front in the region of the town of Belyy. The commander of the air front, Marshal of the Soviet Union S. K. Timoshenko, noted at that /101
time in his order: "On 21 and 22 August, the enemy attempted to break off our troops' movement by means of substantial numbers of tanks and motorized infantry. However, the days for easy victory for the enemy have ended. The heroic 64th and 50th Infantry Divisions and the valiant 47th Air Division (commanded by Colonel O. V. Tolstikov -- Ed. note) hurled back the Nazi tanks, and put the Nazis into disorderly retreat. The enemy lost up to 130 tanks, more than 100 trucks, many guns and much ammunition, and 1,000 men killed or wounded "[121].

The Soviet Air Force fought with even greater sweep in the region of Starodub and Novgorod-Severskiy, where our fighters, in conjunction with troops from the Bryansk front, engaged in battle with the enemy's second tank group, which had advanced behind our lines on the southwest front.

By decree from the GHQ of the commander-in-chief, a special aerial operation was planned and executed in this region; it involved the Air Force from the Bryansk and Rezervnyy fronts, the first reserve air group, and part of the force of the High Command's long-range bomber aviation -- a total of 450 aircraft (commanders were: the Air Force and the Bryansk front -- General F. P. Polynin, the High Command's long-range bomber force -- Colonel L. A. Gorbatsevich, and the first reserve air group -- Colonel D. M. Trifonov). The overall command of the military actions by the Air Force during the operation was in the hands of a group of officers headed by the Red Army Air Force's second in command, General I. F. Petrov.

The aerial operation began on 29 August, and lasted six days. Bombers and assault aircraft, operating in groups of six to nine, sought out enemy tank columns along country roads and highways and showered them with bombs and then machine gun and cannon fire. Each crew made several approaches against its target. Experienced aerial reconnaissance fliers had been sent out in search of German troops, the same fliers who were constantly keeping track of the second tank group's advance to the south and constantly reporting on this operational group of General Petrov's.

During the operation, especially outstanding were the fliers of the 42nd and 52nd Long-Range Bombers Divisions; the 11th, 60th and 61st Combined Air Divisions (commanders: Colonels M. Kh. Borisenko and A. M. Duboshin, General G. P. Kravchenko and Colonels Ye. Z. Tatanashvili and V. P. Ukhov). They made four-five combat missions daily. In all, during the operation our fliers flew over 4,000 missions.

Strikes by Soviet aviation against the enemy's tank columns were rather effective. The commander of the troops along the Bryansk front, General A. I. Yeremenko, reported to the General Headquarters: "On 30-31 August alone, 4,500 various types of bombs were dropped, more than 100 tanks and 20 armored transport carriers were destroyed. and 55 aircraft were downed "[122]. At the same time, the commander of the German Second Tank Group, General Guderian, wrote in his post-war memoirs that as a result of the active operations by the Soviet troops and aviation in the region of Starodub and Novgorod-Severskiy, the advance by the 24th Tank Corps was brought to a halt [123]. /102

In fleeing from strikes by our bombers, the enemy tank division began making night marches in small units, with the result that the rate of their advance to the south dropped off. However, it was not possible to destroy Guderian's tank group in the region of Starodub and Shostka and forestall its advance, as had been ordered by GHQ. The Soviet Air Force's split forces proved insufficient to resolve this difficult mission.

During the summer defensive operations in 1941, the battle against enemy aircraft picked up somewhat. It was carried out by combined efforts by the country's front-line, long-range bomber. naval and fighter air defense. Our Air Force threw 44.1% of all its missions against the enemy's Air Force, i.e., 7% greater than at the early stage of the war.

In contrast to the first days of the war, in August-September 1941 the battle between the Soviet Air Force and enemy aircraft was of a more restricted nature.

At Leningrad, for example, the destruction of the German aviation was based on a joint plan worked out upon decree by the High Command of the Air Force in the northwest on 23 July 1941. Precise zones (regions) were secured by air units of the northern (Leningrad) front and Baltic Fleet, as well as the Seventh Air Defense Fighter Air Corps (commander: Colonel S. P. Danilov); in these regions they engaged in battle against enemy aircraft both on the airfields and in the air. To repulse assaults by German aircraft, several control points were created for guiding fighters and leading them to targets; at these points there were radio stations and experienced air commanders. They constantly carried out aerial reconnaissance, on the data of which strikes were launched against Nazi airfields.

The careful organization of the battle with the enemy aviation yielded positive results. Out of the 4,306 German aircraft which engaged in flights against Leningrad from July to October of 1941, only 508 broke through to the city. Our fighters downed 333 in the air and damaged 90 more at the airfields. Active operations by the Nazi Air Force at Leningrad sharply decreased [124]. /103

Strikes were flown against airfields in the western regions with a broader scope than at the beginning of the war. From 10 to 14 July, front-line and long-range bombers flew 33 missions against enemy airfields, whereas from 22 July to 10 August our fliers made 118 strikes against enemy aircraft at the airfields, flying 1,125 missions [125]. Losses suffered by the enemy Air Force steadily increased.

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During the summer battles in 1941, the Soviet Air Force continued to operate with part of its force against important military objects deep behind enemy lines.

In August, GHQ organized strikes against Berlin, the capitol of Nazi Germany. Crews from the Air Force of the Baltic Fleet and long-range bomber aviation took part in the missions against Berlin.

The Soviet government highly regarded this feat by our aviators. Many participants in the flights against Berlin were awarded government honors, and the most outstanding received the kank of Hero of Soviet Union. Lieutenant V. I. Lakhonin and Captain V. G. Tikhonov, long-range bomber pilots, were among these.

In addition to carrying out the above tasks, the Soviet Air Force engaged in aerial reconnaissance and flew strikes against the enemy's headquarters and communication centers, and destroyed vital points within the operational rear of the enemy's lines. During the first three and a half /104
months of the war, our Air Force flew over 250,000 missions [126].

The intense combat operations and multitudiness aerial battles were a serious school for our fliers. Our faults were brought to life, and measures were taken to eliminate them. Our accumulated combat experience was extended throughout the ranks of the air units and became the common property of all our flight crews.

These first days of the war showed that the German fighters were attempting to split up the large groupings of Soviet bombers and destroy them either in small groups or singly. Therefore, our bombers and assault aircraft made efforts toward maintaining dense combat groups both in flight and at the targets, and thereby created a strong fire screen against the enemy's fighters.

During attacks against tanks, guns, trucks and other combat materiel, the Soviet fliers used not only bombs and machine gun and cannon fire, but incendiary weapons as well, which had been proved highly effective especially in wooded terrain. The altitude for the bombing runs was dropped from two to three thousand meters to 600-800 meters, with the result that our strike accuracy increased.

Elements of our bomber and assault aviation attempted to engage motorized and mechanized columns just at the point when they were in defiles, passes, or were concentrated at river crossings. First, attacks were launched against the leading machines with the object of halting the advance, and then the troops and combat equipment were destroyed.

Fighter elements flying cover for ground troops and rear-area objects, began to be divided into attack and cover groups. The first would engage enemy bombers in combat, while the second would cover them. All these changes in tactics, brought about by combat experience, made it possible to increase the effectiveness of our Air Force's combat operations.

Changes were also carried out in the organizational structure of the Air Force. In August of 1941, as a result of heavy losses suffered by our aircraft and the lack of sufficient reserve to replenish them, the organic numerical strength of our aircraft pools in our air wings was decreased from 60 to 20 aircraft. On this same principle, the command units of our long-range bomber air corps were abolished. To strengthen the Air Force in its most vital aspects, six reserve air groups were created which consisted of four to six /105
air wings each and was a branch of the GHQ. In our Air Force rear-area organs, air bases were eliminated as an unnecessary intermediate control unit between the regions of the air bases and the airfield servicing battalions; at the same time the responsibilities of the Air Force rear-area commander were also eliminated, with the result that he was to report directly to the Red Army Air Force Commander. General N. A. Sokolov-Sokolenok was appointed rear-area commander.

Aerial Encounters over the Capitol

After three months of bloody battles on the Soviet-German front, a short-term pause began. The Nazi hordes, encountering stubborn resistance by the Red Army and suffering heavy losses, were forced to temporarily halt their advance.

However, the situation remained tense for our country. The enemy, having occupied substantial territory and having blockaded Leningrad on the ground, was not on the approaches to Moscow. Putting the national economy on a war footing had not been finished. Many military industrial enterprises which had been evacuated to the east were not yet turning out products. By comparison with August, the output of aircraft in October 1941 had decreased 1.4-fold, in November -- 2.4-fold, and in December -- 2.5-fold [127]. The Soviet Armed Forces were experiencing extremely short supplies in aircraft, tanks, guns and other equipment.

In attempting to achieve final victory, the enemy began to throw his main strike at Moscow with the object of encircling and crushing the main forces of the Red Army and taking Moscow, i.e., in achieving his operation "Typhoon". In addition, strikes were also being made in other directions.

The "Center" army group working in the direction of Moscow had 75 divisions and surpassed Soviet forces 1.4-fold in numbers of personnel, 2.2-fold in tanks, and 1.9-fold in guns and mortar. The Second Air Fleet, reserved to support it, had 950 aircraft, of which 52% were bombers. At that time, our front-line aviation -- the Air Force of the western, reserve, and Bryansk fronts (commanded by Generals F. G. Michugin, Ye. M. Nikolayenko and F. P. Polynin) -- numbered only 391 fighters, 2.4-fold fewer than the enemy. In /106

adding, the Soviet Air Force initially had aircraft of basically obsolete construction which were inferior to the German aircraft with respect to combat capability.

Formations of long-range bomber aviation as well as wings of the Sixth Fighter Air Defense Corps were partially used to reinforce our front-line aviation in the vicinity of Moscow, which helped to somewhat decrease the enemy's numerical air superiority.

Early on the morning of 30 September, enemy artillery started rumbling. In the clear sky their appeared hundreds of German aircraft, which dropped bombs on our troops and defensive positions. Thus began the historic battle for Moscow, which was to last more than six months.

The onslought of groups of the "Center" armies was covered by massed strikes of German aircraft against our capitol. The object of the Nazi barbarians was clear: to use air strikes to cripple Moscow's industrial installations, paralyze its life, destroy the morale spirit of the country's population, and aid the tank divisions in conquering the city. "The Führer's firm decision was to raze Moscow and Leningrad to the ground... It was the Air Force's mission to destroy the cities," [128] -- General Halder noted in his diary.

In Nazi High Command gave its best bomber command the mission of destroying Moscow. Special confidence in this mission was placed in the 56th Air Squadron, the "Condor Legion", as well as the 26th and 55th Bomber Squadrons, which had become known as the ruthless bombers of peaceful populations in Republican Spain, as well as France, Poland, Yuglosiavia, Greece, and England. To achieve several missions per day, the Nazi squadrons shifted their bases closer to the city -- at the airfields of Minsk, Bobruysk, Orsha, Mogilev and Vitebsk.

The first massed mission against Moscow was carried out by the German aviation on the night of 22 July. Under the cover of darkness, 250 bombers, divided into several echelons, approached the capitol at an altitude of five to six thousand meters. The first echelon had the mission of dropping incendiary bombs in the center of the city and, having ignited fires, to thereby create orientation points for the operations of subsequent groups of bombers.

Our aerial observers, vigilantly standing guard over the city, rapidly gained site of the enemy aircraft. The forces in Moscow's air defense had been /107
brought up to combat readiness. Fliers from the Sixth Fighter Air Defense Corps (commander: Colonel I. D. Klimov, and after 9/11/41 -- Colonel A. I. Mitenkov) took to the air. Engaging the enemy bombers far out on the approaches to the capitol, they disrupted the flight formation of their first echelon.

Flight commander K. N. Titenkov entered into single combat with an experienced enemy pilot leading the Nazi bombers. A remarkable master of aerial combat, the Soviet flier silenced the gunner with a short blast and then, with no obstacles, set fire to the enemy aircraft, which plummeted to

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earth. The other bombers in the first echelon, left without a commander, scattered and fled from Moscow.

With each approach of new groups of German bombers to the capitol, the Soviet command sent fresh fighter wings into combat. The assault lasted five and a half hours. The beams from antiaircraft lights, crossing the sky, aided the fliers in picking out the enemy in the darkness of the night. Closer along the approaches to the city, the path of the enemy through the air was blocked by heavy fire from our antiaircraft artilleries and cannon. Moored balloon obstacles covered the most important objects in the city.

Encountering such a stiff repulse by our fighters and air defense ground units, most of the Nazi aircraft turned back. Only single bombers reached Moscow and dropped their bombs off-target. At night the enemy lost 22 aircraft, 12 of which were downed by Soviet fighters and 10 by antiaircraft batteries.

For their successful operation in repulsing the onslought against Moscow, the fliers of the Sixth Fighter Air-Defense Corps received the thanks from the defense people's commissar, and 17 aviators were awarded government honors, among them First Lieutenant P. V. Yeremyev, Second Lieutenant P. A. Mazepin and others.

After this July night, strikes against Moscow followed one after the other. In each of them there were 200-300 aircraft. To reach the appointed targets, the Nazi command did everything possible: sent in new bombers squadrons, strengthened the Second Air Fleet with four groups of long-range bombers totaling 100 aircraft sent from France, changed their tactics of operations, and organized strikes not only at night, but during the day as well.

However, throughout July, August and September, the enemy did not manage not only to destroy Moscow, but to even inflict significant losses. All assaults ended in failure and heavy losses for the German aviation. Only single planes got through to the city. On the approaches to the capitol in only two months -- July and August -- 200 German bombers were downed [129]. /108

In October, when the Nazi troops, renewing their offensive, approached close to Moscow, the situation deteriorated. The enemy Air Force, despite its losses, pushed their way through in various directions both day and night.

During these difficult times, in accordance with instructions from the Party Central Committee, the Moscow Air Defense was strengthened with troops and equipment: fighters, antiaircraft artillery, barrage balloons, and radar installations. The wings of the Sixth Fighter Air Defense Corps had at that time approximately 700 aircraft. These were being reinforced with aircraft of the newest construction (Yak-1, Mig-3, Lagg-3), which already constituted 56% of the overall aircraft in the pool. Fighter units from the front-line Air Force were more broadly used to engage enemy aircraft at the far approaches to the capitol. A new squadron of communists and communist youth was mobilized for the air defense wings and small units. At the same time, upon decree from

General Headquarters, front-line and long-range bombers flew several missions against the enemy's most important bases, as a result of which the strike force of Nazi bomber squadrons was substantially weakened.

Because of the growing strength of our air defense, enemy strikes against Moscow were being more and more successfully repulsed. In October the Nazi Air Force flew 31 missions, in which over 2,000 aircraft participated, but only 72 bombers, or 3.6%, succeeded in breaking through to the capitol.[130] The Nazis lost 278 aircraft in aerial encounters and by antiaircraft artillery fire. And in November, the number of bombers which broke through to the capitol substantially decreased to only 1.4% [131]. The enemy failed in his insidious plans.

The Soviet fliers fought heroically in aerial battles near Moscow. The skies over the capitol saw the nascent glory of the able and fearless Soviet ace, communist youth member Viktor Talalikhin, who during the night of 7 August rammed a Nazi Heinkel-111 bomber. "I managed," -- Talalikhin later recounted, -- "to knock out the bomber's right engine. The enemy turned sharply, changed course and, with a drop in altitude, headed back... And right at that point my ammo ran out. I could have kept after him, but what was the use? Even with one engine he could fly pretty slow and still get away. There was only one thing left to do -- ram him. If I got killed, I figured, /109
there was only one of me and four Nazis in the bomber. I decided to knock off his tail with my prop, so I was flying right up to him. We were about nine or ten meters apart. I could see his belly, when suddenly he opened up with a burst of heavy-caliber machine gun fire. My right-hand was on the controls waiting. Then I gave it the gas and rammed into him not just with my prop but with my whole plane "[132].

V. V. Talalikhin

For his exemplary carrying out of his combat missions and the bravery and courage shown at that time, on 8 August 1941 V. V. Talalikhin was awarded the Rank of Hero of the Soviet Union. On 27 October, not far from Podol'sk, in the Moscow region, communist youth Talalikhin fell to his heroic death in an uneven encounter with enemy fighters. His name is forever inscribed in the ranks of the group of the N-th Fighter Air Wing.

A. N. Katrich, A. M. Luk'yanov, and many other Soviet aces were also awarded the Rank Hero of the Soviet Union for repulsing enemy aviation strikes against Moscow.

In carrying out resolute combat with the enemy Air Force, our fliers destroyed over 1,000 aircraft from October to December 1941. By mid-November, the second Nazi Air Fleet was substantially weakened and totalled approximately

670 aircraft. At that time, the grouping of our aviation was strengthened due to the shifting of air units from other sectors of the front and had 1,138 aircraft at its disposal, 738 of which were serviceable. Because of this, the Soviet Air Force achieved a numerical superiority over the enemy. Gradually the initiative began to shift to our aviators. By the end of November, the Soviet Air Force had succeeded in achieving air supremacy around Moscow.

Thus, it was outside Moscow that the Nazi German Air Force lost air supremacy for the first time during World War II. The German bombers lost /110
their ability to carry out significant strikes against our capitol and the Moscow surburban industrial regions.

The Soviet Air Force created favorable conditions for our ground troops to engage in combat. Our command now had the ability to achieve regrouping of troops, and concentrate and put into combat those reserves which were in better shape, without the fear of significant opposition by Nazi aviation.

Soviet aviation also took an active part against advancing enemy troops. Our fliers' continuous strikes against the enemy, well coordinated with the operations of our defensive ground troops, were highly effective. They decreased the Nazis' ability to advance and dealt him substantial losses in both personnel and equipment.

In November, when the Nazis began their "second general offensive" against Moscow, the situation was critical. To destroy Nazi tanks, guns and other equipment, we threw in not only our assault aircraft and bombers from both front-line and long-range aviation, but our fighters as well, including wings of the Sixth Fighter Air Defense Corps. Here, too, reserve air groups under the command of Generals A. A. Demidov and I. F. Petrov, the Moscow Air Defense Zone (commanding general -- N. A. Sbytov) were borrowed, as well as air units and commands from other sectors of the Soviet-German front, which were immediately included in combat operations.

The main efforts of the Soviet Air Force were concentrated to the northwest of Moscow, where the Third and Fourth Tank Groups -- the enemy's most dangerous grouping -- were advancing. The Red Army Air Force commander coordinated the efforts of aviation on the outskirts of Moscow with the aid of specially created operational groups. To increase the intensity of our flights and make better use of our materiel, two shifts of crews were created in the individual wings which were armed with obsolete SB aircraft: one was used for operating during the day, while the other was used at night.

As the result of the heroic defense by the Red Army, the Nazi advance was routed. The plan for "blitzkrieg" was destroyed once and for all. The service of all the fighting men in the Red Army, including the Soviet fliers who defended Moscow in the air and aided our ground troops in forestalling this advance, contributed toward this success.

During the defensive operations outside Moscow, the Soviet Air Force flew 51,300 missions, 86% of which were in the interests of defending front-line troops, and 14% were for the defense of Moscow. All in all, from 22 June to

1 December 1941, i.e.. during the period of the summer and autumn campaign of 1941, our fliers flew more than 400,000 combat missions [133]. /111

^ I. Molodchiy (right) and I. V. Kulikov

The Communist Party and the Soviet government highly praised the actions of our Air Force. On 6 December 1941, for their outstanding successes against the Nazi invaders, six air wings were switched to guard wings. The galaxy of the air guard was headed by the twice-honored Twenty Ninth Fighter Air Wing (commander: Major A. P. Yudakov). This wing had a glorious combad tradition. It was formed on the basis of the first socialist air squadron, which was created during the first days of the Soviet government. Prior to the war, such outstanding fliers V. P. Chkalov, S. I. Gritseveth and A. K. Serov received schooling and achieved training there. During four months of the war, the fliers from this wing downed 67 aircraft, set dozens of trucks afire, and destroyed many Nazis.

The Guard designation was also obtained by the 129th, 526th, and 155th Fighter Air Wings (commanders: Majors Yu. M. Berkal', N. P. Metelkin and A. F. Shpak), the 215th Assault Air Wing (commander: Major L. D. Reyno), and the 31st Bomber Air Wing (commander: Colonel F. I. Dobysh). /112

Thousands of aviators were awarded orders and medals, and 52 of the bravest and most daring gliers were awarded Gold Stars of Heroes of the Soviet Union; among these were : fighter pilots V. I. Matveyev, D. A. Zaytsev, V. G. Kamenskchikov, A. F. Loktionov, A. P. Perepelitsa, N. Ya. Totmin, F. M. Fatkulin and S. G. Ridnyy; assault pilots S. G. Get'man and A. A. Lozhechnikov, front-line bomber pilots A. V. Mikhaylov, V. D. Panfilov and N. A. Sdobnov, High command long-range bomber pilots N. V. Kryukov, V. I. Malygin, A. I. Molodchiy, A. G. Rogov and V. I. Shchelkinov, and Civil Air Fleet flier A. I. Gruzdin and others.

The Enemy's First Major Defeat

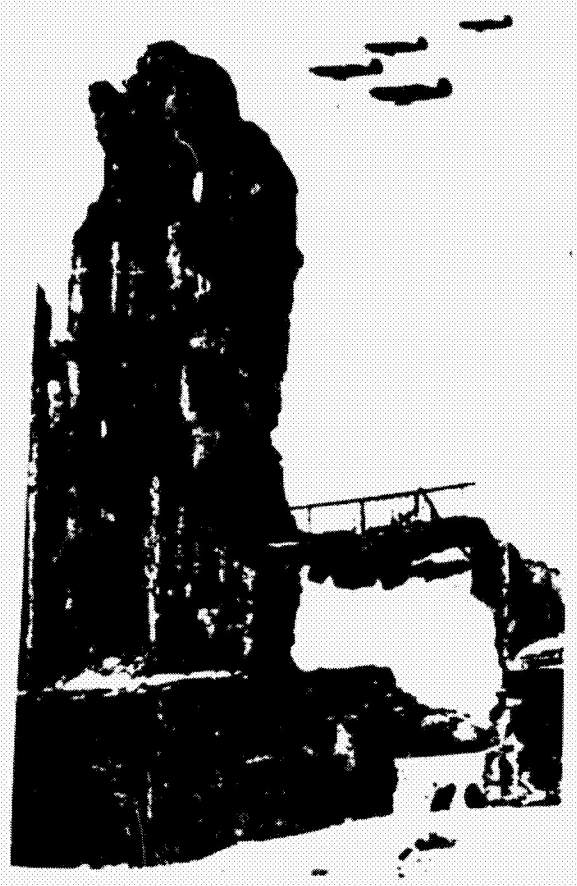
In early December 1941, having halted the enemy on the approaches to the capitol, the Red Army shifted into a counteroffensive. Preparation for this had begun even during the period of fierce defensive fighting. The Air Force participated, along with ground reserve troops. Air wings were secretly being shifted from deep behind our line to the Moscow airfields, at which point new Air Force commands were also being concentrated from other sectors of the Soviet-German front.

The reinforcing of our troops with reserves shifted the ratio of strength at Moscow. Whereas in October-November the "Center" army group had had a two- to three-fold superiority with respect to tanks and artillery in that area of operations of his assault groupings, by the beginning of the counter-offensive his advantage in terms of equipment was less significant. With respect to aviation, however, we not only equalled the enemy, but almost doubled his force.

The Air Forces on the Kalinin, Western and part of the Southwestern fronts, which were to participate in the counteroffensive, by early December numbered 565 aircraft (the Air Force Commander on the Kalinin front was General N. K. Trifonov and, after 4/1/42, it was General S. I. Rudenko; on the southwestern front it was General F. Ya. Falaleyev, and on the western front it was General N. F. Naumenko and, after 17/2/42, it was General S. A. Khudyakov). Also taking part in the combat operations were the Air Force of the Moscow Defense Zone under the command of General N. A. Sbytov, the Sixth Fighter Air Defense Corps, reserve air groups under the command of General I. F. Petrov and General G. P. Kravchenko, as well as High Command long-range bomber aviation. All in all, our air grouping totalled approximately 1,200 aircraft [134].

In addition, the Soviet Air Force was improving qualitatively. In our /113
fighter units, approximately 75% of the aircraft were of new design (Yak-1, Mig-3 and Lagg-3 aircraft). More and more Il-2 assault aircraft and Pe-2 bombers were being sent to the front. However, there were not sufficient numbers of new aircraft. Therefore, we still had to make broad use of our obsolete models (Po-2, R-5, and Rz), which earlier had been used only for trainers. Night bombers air wings equipped with Po-2 aircraft were formed. These wings were quite adapted to front-line action and participated actively in action outside Moscow.

In addition, the combat skill of our fliers was improving. They became wiser in matters of tactics. Our air commanders and headquarters units at all levels had been gaining the necessary experience with respect to commanding and guiding the combat operations of the Air Force. "At this stage of the war," -- wrote the west-German military historian Greffrath, -- "... both the command and the flight personnel of the Russian aviation were becoming substantially more experienced. The Russians' inclination toward concentrating their forces, as well as their more organized tactical application, became apparent " [135].



Soviet Fighters Over Stalingrad.

The counteroffensive by Soviet troops had as its object the destruction of the "Center" army group at the approaches to the capitol and the elimination of the immediate threat to Moscow.

The primary task of Soviet aviation in the counteroffensive was the support of ground troops. Along with this, the Air Force had to cover Moscow from enemy strikes, maintain air superiority, destroy enemy railroad shipments, and engage in aerial reconnaissance.

Because during this operation the western front was the most vital, approximately 80% of all the air groupings concentrated in the Moscow region were shifted to the General Headquarters of the Commander-in-Chief for Operations. In turn, the commander of the front aimed three quarters of the aircraft in his command on the right wing -- against the stronger and more dangerous enemy grouping located northwest of Moscow. Remaining forces were intended to support front-line troops moving to the southwest of the capitol.

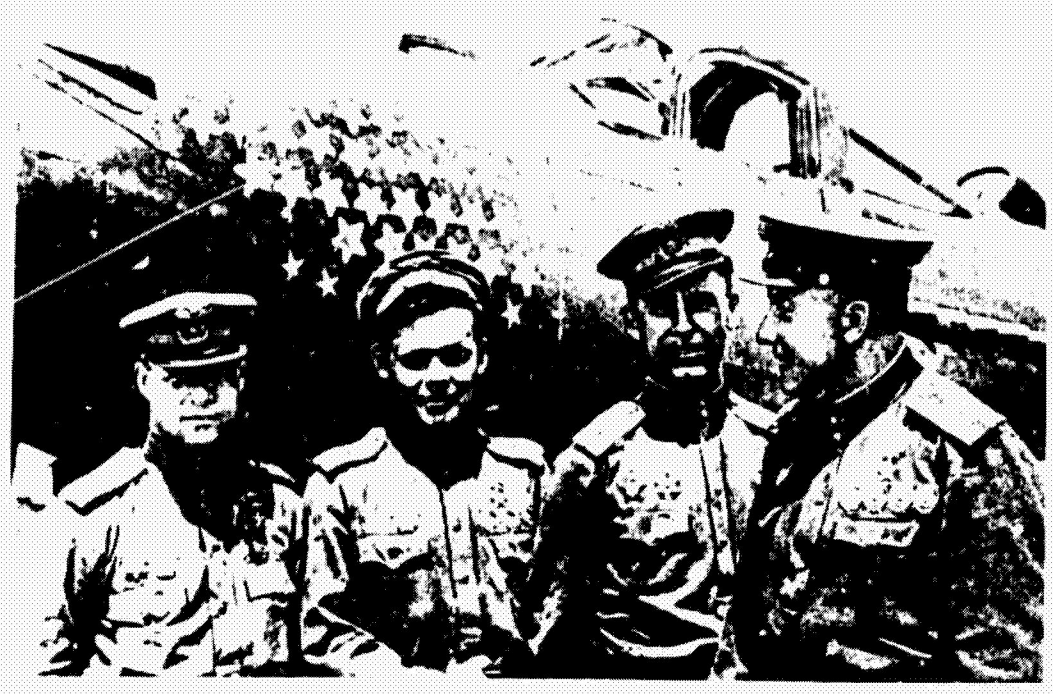
Landing of Parachute Assault Troops by Aircraft.

Ground-Based Radio Control of Fighters, Kuban', 1943.

The troops and aviation prepared for the counteroffensive under the difficult winter conditions and in a short time period. Air representatives had been selected for the armies' combined-arms headquarters, while "communications delegates" and observers were selected from the infantry divisions and brigades. The Air Force representatives, along with the combined-arms commanders, worked out the concrete targets for air units and established the sequence of plotting of strikes against them by artillery and aviation. Along with this, questions of target designation were worked out.

Aerial reconnaissance photographed/114 the main units of enemy resistance, and uncovered air bases and reserve disposition points. Rear-area Air Force units built up seven-ten-day reserves of materiel and the required forces for establishing and building airfields on territory liberated from the enemy. The accumulated combat experience was analyzed and generalized in air units, and the enemy's tactical methods in the air were studied.

Preparing TB-7 (Pe-8) Heavy Bombers for Combat Missions.



Heroes of Aerial Battles over the Kuban' (left to right): Captain A. F. Klubov, Captain G. A. Rechkalov, lieutenant A. I. Trud and Major B. B. Glinka.

After a Strike by Our Aviation...

On the morning of 5 December, the troops of the Kalinin front launched the counteroffensive. The armies of the western front to the north and south of Moscow began the counteroffensive on the morning of 6 December. Active combat operation of Soviet troops and aviation built up simultaneously on a front extending approximately 1,000 kilometers.

One More Nazi Aircraft Downed!

On the night of 6 December, the weather was inclement. The sky was overcast, and snow was falling here and t ere. However, this did not stop our night bombers in the field of the offensive on the right wing of the western front from carrying out 150 missions and dropping their bomb loads on the most important enemy targets (headquarters points, communication points and reserves). Light-engined Po-2 and R-5 aircraft also flew missions against the Klin and Vatulin airfields, where up to ten German aircraft were destroyed.

In the morning, hundreds of artillery and mortar batteries opened fire against enemy defensive positions. In the sky there appeared Soviet bombers and assault aircraft, which attacked fire points, blindages and earth-and-timber pillboxes at the forward edge of the defenses. The infantry and tanks moved in on the attack.

The enemy put up stiff resistance. At certain sectors of the front he launched counterattacks. But our troops, supported from the air by our aviation, beat the enemy back from vital points and steadily pushed forward.

Especially intense battles broke out around the large town of Kryukovo. Here the Nazis put up a powerful defense. They turned every stone building into a pivot of defense. They covered the streets with heavy artillery and machine gun fire. Fierce fighting went on at every house.

To speed up the enemy's rout, it was decided to attack him at night as well. Starting on the evening of 7 December, the enemy's defensive positions were subjected to the operations of our night bombers. Throughout the night our fliers wore down the enemy. They put many of his cannon and machines out of action, and destroyed several earth-and-timber positions. Our indefatigable "dragon flies", as our troops fondly called our Po-2 aircraft, flew four to six missions each night.

To designate the forward limit of the lines, our infantry units lit bondfires and "...t" lamps. As a result, not a single bomb was dropped on positions of Soviet troops, although our night fliers dropped their death-dealing load extremely close to our lines. /115

The Commander or Troops along the Central Front, General of the Army K. K. Rokosovskiy (right to left): (third) and Commander of the 16th Air Army Force Lieutenant General S. I. Rudenko (fourth) Observe an Aerial Battle over Kursk. July 1943.

As a result of our night attacks, supported by aviation, troops of the 16th Army occupied the town of Kryukovo. The Nazis left over 40 destroyed tanks and many dead soldiers and officers here.

On the left wing of the western front, the Tenth Army supported by the 28th Air Division (commander: Colonel S. Ya. Mozgovoy) launched its offensive in the direction of Mikhaylov. At the same time, the 50th Army and the First Guard Cavalry Corps continued pressing the enemies to the east of Tula. Bad weather held back operations by the Soviet Air Force. Daily they flew only 90 to 100 missions here, destroying the enemy both in the battlefield and along the routes of his retreat.

In supporting the ground forces, our fliers flew approximately 800 missions during the first three days of the offensive. Enemy bombers in small groups attempted to forestall the advance of Soviet troops but, encountering heavy resistance from our fighters, gave up their attempts.

The Red Army's offensive developed successfully. Under the assaults of Soviet troops, the Nazi Army rolled back to the west. From this point on, our air units and commands set about carrying out missions of destroying the retreating enemy. On 9 December, aerial reconnaissance located a large column of trucks moving along the Klin-Teryayeva Sloboda Highway. Nine Petlyakov aircraft from the 23rd Bomber Air Division (commander: Colonel V. Ye. Nestertsev), receiving the order to destroy the column, made three approaches

to their target. With bombs and machine gun fire they set fire to more than ten loaded trucks. The column came to a halt. A bottleneck developed. Right behind the first group came a second and third group of Soviet bombers, which finished the destruction of the enemy column.

Fighters from the Sixth Air Defense Corps, which were covering the capitol in the air, were sent into assault operations against the retreating enemy in the field of advance of the 20th and 16th Armies. The fliers from this corps had already long before proven themselves as a good support for ground troops. They had flown 90% of all their combat missions as direct support.

In flying precise strikes against the retreating enemy troops, our fliers showed their heroism and courage. During the storming of one German column, the aircraft belonging to the wing commander of the Sixth Fighter Air Defense Corps, Lieutenant V. Ye. Kovalev, was knocked down by a shell. Our winged warrior aimed his plummeting aircraft at the enemy. Several ammunition-laden trucks and antiaircraft guns flew into the air. This true son of his homeland, communist V. Ye. Kovalev, on 4 March 1942 was posthumously presented the Rank of Hero of the Soviet Union. /116

The retreating enemy put up a stubborn resistance. His troops did everything possible to keep roads open and maintain for himself paths of retreat to the west. Often the Nazis would revert to a counterattack, at which point our aviation would play a vital role in breaking up such attacks. It would fly strikes against both the counterattacking troops and their reserves. The Germans prepared one such counterattack in the region of Klin. The Nazis concentrated many tanks here, but they had insufficient fuel. Then they decided to make contact with their supply dumps on horseback over dirt roads, inasmuch as highway communications were being attacked by Soviet aviation. However, our aerial reconnaissance caught site of this column just in time. Our night bombers were given the mission: destroy the supply train. Our night fighters bombed the column for three hours. The counterattack was routed, and Soviet troops captured many enemy tanks, guns and mortars.

To fully cut off the Nazi means of retreating from Klin, on the night of 15 December a force of 415 men was air-dropped in the region of Teryayeva Sloboda. The members of the air-borne landing force cut off the major roads, destroyed bridges, disrupted lines of communications and forced the Nazis to abandon their equipment and take off across snow-covered fields and there suffer substantial losses to strikes by our aviation.

The enemy, in attempting to forestall the advance of Soviet troops, frequently threw large groups of bombers into battle covered by fighters. Fierce battles were fought in the air. Thus, on 15 December five fighters of the 43rd Combined Air Division (commander: Colonel I. Ye. Obrazkov) led by First Lieutenant T. K. Romanenko engaged in unequal combat with 40 enemy bombers and 15 fighters. The brave eagles downed three German aircraft, while the remainders were scattered and repulsed; our fighters suffered no losses. On the same day, six fighters of the Fifth Guard Fighter Air Division under the command of Major Yu. M. Berkal' engaged 18 Ju-87 aircraft in battle. The Guards fighters downed five of the Junkers.

During the counteroffensive, our attacks on the enemy's aviation at his airfields did not slacken. The airfields at Vatulin, Klin, Mozhaysk, Kaluga, and Mtsensk, where enemy air groups were based, were repeatedly subjected to aerial attacks by our bombers. The enemy lost dozens of aircraft on the ground. In addition, he suffered heavy losses in the air. During the December counteroffensive, our aviation destroyed approximately 200 German aircraft on the ground and in the air. Soviet fliers forcefully maintained air superiority. /117

During the operation, the Soviet Air Force carried out aerial reconnaissance and air-lifted ammunition, medicine, and supplies to our ground troops. On 19 December alone, the air group under the command of General I. F. Petrov dropped seven tons of ammunition to our advancing troops.

By late December 1941, aerial reconnaissance was being carried out over the railroad junction stations of Minsk, Polotsk, Vitebsk, Orsha, Smolensk, Vyaz'ma, and Rzhev which revealed concentrations of railroad echelons: the Nazi command was hurriedly shifting fresh troops from the rear with the object of holding back our advance. Upon order from GHQ, our long-range bombers operated against these railroad centers for 15 nights. More than 30 echelons carrying both personnel and equipment were destroyed and set afire, and at many points the railroad roadbed was destroyed [136].

As a result of the operations during December of 1941, our ground troops and aviation broke up enemy strike groups threatening Moscow from the north and south. The enemy was thrust back on the west by 100 to 250 kilometers. The immediate threat to the city had been eliminated.

During 24 days of battle, and in spite of partial snowfall and low cloud-cover, our fliers had flown over 10,000 combat missions and had put out of commission dozens of enemy tanks, hundreds of trucks with both personnel and equipment, and many cannon and mortars [137]. The Soviet Air Force Command had an effective and highly mobile means for routing the enemy. Its force could be rapidly shifted to any point with vital missions were being fought.

However, there were nevertheless substantial drawbacks in the combat application of our aviation.

Troop support when the enemy's defenses had been broken had been limited to periodical operations by small groups of aircraft. On the battlefield, there was no clearly organized control and guidance of aircraft to their objects. This decreased the effectiveness of our air support. In addition, our air groups, fearful of hitting our own troops, were forced to fly assaults deep behind the enemy lines, which also led to a break in Air Force operations and advancing troops both with respect to time and place. Our ground troops were frequently left with air cover because during the offensive our rear-area units could not move forward and build new airfields fast enough, so that our fighters had too few airfields.

In early 1942, the Red Army launched a general offensive. In four months of fierce battles (January to April) it dealt the Nazi German troops heavy new /118

losses. At main points along the Soviet-German front, the enemy was thrust back to the west 100 to 250 km at points. During this time, the Soviet Air Force flew over 50,000 combat missions in the western regions alone [138].

A. N. Vitruk (left), Commander of the 65th Assault Air Wing, and Military Unit Commissar V. P. Kondyukhov (right) Briefing Lieutenant G. T. Nivkimlov before a Combat Mission.

During the winter battles of 1941-1942, the Nazi Air Force suffered substantial losses. On the western sector alone the enemy lost more than 1,100 aircraft. The enemy's best air squadrons had been bled white. In aerial battles, his most experienced flight personnel had been annihilated. The enemy's bomber aviation suffered especially heavy losses. All this substantially decreased the effectiveness of the German Air Force. "In the winter of 1941, the German bomber aviation was dealt its first crushing blow..." [139] -- wrote the West-German military historian Greffrath.

The victories achieved in the battle for Moscow and in the subsequent winter offensive of 1942 laid to rest the myth of the invincibility of Hitler's /119 Army and its Air Force. They were witness to the growing skill of all Soviet fighting men, including our aviators. During the period from January to May of 1942, the Soviet Air Guard added 14 more air wings.

In the battle for Moscow, and along other sectors of the front, the Soviet eagles added many glorious pages to the combat chronical of Soviet aviation. Fliers and commanders B. G. Bolotov, A. N. Vitruk, Ye. M. Gorbatyuk, G. A. Grigor'yev, I. N. Kalabushkin, N. G. Liskonozhenko, A. N. Katrich, V. N. Matakov, I. M. Kholodov and many others gained renowned as skillful and brave aerial fighters. They were all awarded the Rank of Hero of the Soviet Union. In the Sixth Fighter Air Defense Corps alone, 23 fliers were awarded this high honor.

B. I. Kovzan

B. I. Kovzan demonstrated unparalleled bravery, fortitude and high flight skill in those days. On 22 February 1942, on the eve of the anniversary of the Red Army, during a patrol of the railroad leading to Moscow he engaged three Ju-88 bombers in combat. Having disrupted their ranks, the fearless flier rushed to the attack of the leader. However, at the crucial moment his armament failed. Then he made use of the power of his propeller which he used instead of machine gun fire. Like a cycle, he sliced off the tail of the Junkers. Loosing control, the Ju-88 fell in its last dive. This was the second enemy aircraft he had destroyed by ramming. On 24 August 1943, he was awarded the high Rank of Hero of the Soviet Union.

High combat skill and fearless heroism were also demonstrated by the son of the outstanding revolutionary and Civil War Wing Commander Timur Frunze in battles near Staraya Russa. Flying cover for ground troops together with Lieutenant I. P. Shutov, Frunze caught sight of a large group of Nazi bombers with fighter /120
cover. The fearless eagles turned their course and decisively rushed to meet the enemy. In their first attack they managed to down the leader and instill confusion in the enemy ranks. The bombers began dropping their bombs on their own troops. However, the battle was uneven, and the Nazis succeeded in downing Timur Frunze's aircraft. The courageous flier died the death of the brave. The Soviet government posthumously awarded him the Rank of Hero of the Soviet Union.

In the winter of 1941/1942, the Soviet Air Force gained its first experience in combat action during offensive operations. The skill of our flight commanders grew, as did that of the headquarters commanders, who began to better direct the combat actions of their subordinate air units and commands. The cooperation between the front-line Air Force and ground troops grew closer and closer. The Air Force began to concentrate its efforts more firmly in the main areas where our troops were advancing. Numbers of missions which our Air Force made against enemy airfields increased. The accumulated experience of combat operations was carefully studied, with the result that it was made full use of in the subsequent encounters in 1942.

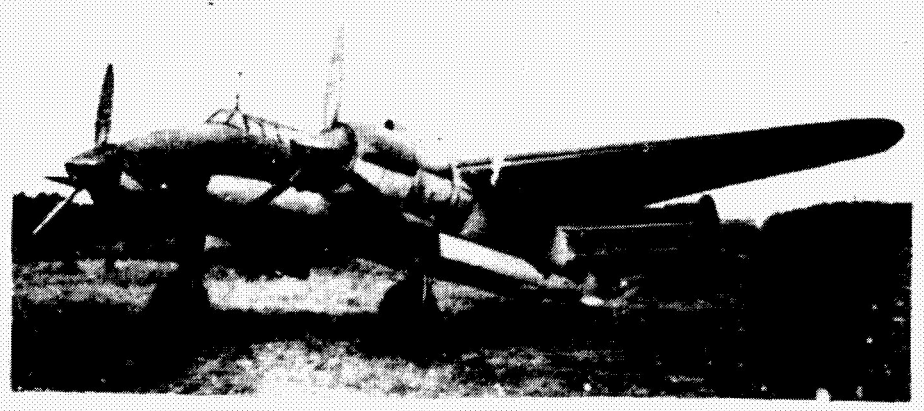
Between the Volga and the Don

After our winter offensive operations, in the spring of 1942 the Red Army shifted to the defense.

A temporary lull settled on the front. This period of temporary respite was used to strengthen our combat training and prepare for forthcoming

battles. Our Air Force units and commands held flight and tactical conferences and meetings on spreading the lessons of combat experience among the ranks. The most effective means for using aviation during offensive and defensive operations were worked out. Great attention was given to achieving cooperation between the Air Force and ground troops.

Through the selfless labor of workers, laborers, engineers and technicians, our aircraft industry took a great step forward during the second half-year of the war. The aircraft factories which had been evacuated to the east were turning out combat aircraft. Starting in January 1942, the production of aircraft grew with each passing month. In May 3.6 times as many aircraft were turned out as had been in December of 1941 [140]. The field army began to receive more and more new types of aircraft: Yak-7b fighters, Il-2 assault /121
aircraft and Pe-2 dive bombers. By July, the number of aircraft at the front had increased more than 1.3-fold by comparison with January of 1942. However, the new aircraft were still few in number. They totalled only 47% of the overall number of aircraft in our pools. We were especially lacking in new bombers, which accounted for only 10%. The lack of daylight bombers had to be made up, and our obsolete aircraft (the Po-2, the R-5, and the SB) were broadly used during night operations.



The Tu-2 Bomber.

Soviet scientists and engineers were constantly improving the quality of our aircraft. In August of 1942 the Design Bureau headed by A. S. Yakovlev modified the Yak-7 fighter and increased its range by 50 kilometers. Somewhat later, the Yak-9, with the speed of 597 km/hr and armed with 37-mm cannon and 12.7-mm machine guns, was put into serial production. A group of engineers headed by the designer S. A. Lavochkin put the La-5 fighter into serial production. In combat capability, particularly with respect to speed, this fighter surpassed the Nazi Messerschmidt. In June of 1942, the Tu-2 front-line bomber was put into use. Before the end of the war, the aircraft industry turned out 63 such aircraft.

Behind our lines, air units and commands were being formed. In the first six months of 1942, several hundred combat-ready air wings were prepared and sent to the front.

In the spring of 1942 the organizational structure of the Air Force was improved. The combat operation had shown that the existing organization, under which the main part of our bomber, fighter, and assault forces was dispersed among the combined-arms armies and not united under a single commander, did not /122 meet the demands of war and required radical changes.

In May-June, the front-line Air Force was reorganized. We formed air units from the combined-arms armies. They were broken down in terms of personnel and purpose of the air group (reserve, strike, maneuvering). The entire front-line Air Force was reduced to large formations -- air armies, which as a result consisted of homogeneous air divisions (bomber, assault or fighter). By autumn of 1942, 17 air armies had been created.

The new organizational structure of the front-line Air Force made it possible to more effectively control its units and ease the concentration of air power in the main directions, as well as carry out the most important mission, and thus achieve central control of the entire front-line Air Force during an operation.

In March of 1942, the High Command's long-range bomber aviation was put under the command of the chief of the Air Force. A long-range Air Force was created on the basis of the units and large units; this Air Force answered directly to the defense people's commissar and the general headquarters of the Supreme Commander. The commander of this long-range Air Force was General A. Ye. Golovanov. The object of this reorganization was to use our long-range aviation primarily for attacking objects in operational and strategical rear areas behind the enemy's lines.

In the summer of 1942, most significant events took place on the southern wing of the Soviet-German front. The Nazi command, taking advantage of the lack of a second front in Europe, concentrated large forces of troops and aviation against the Red Army, restaffed from its own losses, and began new offensive operations.

The primary event of the summer and autumn conflicts of 1942 was the heroic defense of Stalingrad. For several months, both along the broad windings of the Don River and then along the Volga Steppes, not a single day went by which was not disrupted by ground and air battles which were unprecedented in their fierceness.

The German command threw its select troops toward Stalingrad: the Sixth Field and Fourth Tank Armies, totalling approximately 30 divisions. From the air they had the support of squadrons from the Fourth Air Fleet, which numbered 1,200 aircraft [141]. Later, the enemy's troops were to grow continuously.

The troops on the Stalingrad front had hardly half the enemy's size in /123 tank, guns or fighting men. But with respect to front-line aviation, the enemy's superiority was even greater. On 12 July, the front-line Eighth Aerial Army under the command of General T. T. Khryukin numbered slightly over 300 aircraft. This included 150 to 200 long-range bombers and the 102nd Air Defense Fighter Division (division commander: Lieutenant Colonel I. I.

Krasnoyurchenko and, after 16 October 1942, Colonel I. G. Puntus), which had 50 to 60 aircraft. In overall numbers, our air grouping had 500-580 aircraft, more than 200 of which were obsolete.

Defensive battles in the Stalingrad region began on 17 July. The Nazi command aimed at encircling and destroying Soviet troops at the Don River, and then take Stalingrad in a rush. The Nazi Air Force bombarded the military implacements of Soviet troops and airfields, and destroyed crossings over the Don, and flew strikes against railroad objectives.

The intensity of the battle increased with each passing day. The battles went on day and night.

On 26 July, after fierce battles, the Nazis broke through the lines of the 62nd Army and encircled its troops in the region of Verkhne-Buzinovka. However, counterstrikes by units of the Stalingrad front supported by all our available Air Force brought the enemy's offensive to a halt and enabled our troops to escape encirclement.

Units of the Eighth Air Army and long-range aviation used here dropped hundreds of tons of bombs on the enemy. Soviet aviators displaying outstanding courage and fearlessness destroyed enemy tanks and personnel. Especially successful were the operations by fliers of the 150th Dive-Bomber Wing, commanded by the renowned master of sniper attack Lieutenant Colonel I. S. Polvin. In four days, Polvin's men destroyed 40 enemy tanks and 50 trucks. However, the situation continued to remain crucial. On 31 July, units of the Fourth German Tank Army forced the Don and rushed toward the Volga along the Kotel'nikovo-Stalingrad railroad. Supporting their tank forces, the German Air Force flew some 300-700 missions daily in this area. Under the cover of their fighters, Nazi bombers actively operated against our troops. A deadly battle was going on over the city. The chief danger now was not from the west but from the southwest. As a result of this, the commander of the Eighth Air Army concentrated several air wings (approximately 100 aircraft) at his nearest airfield; these aircraft were slated for battle against enemy tanks and motorized units of the Fourth Tank Army. Not only were fighters from the Eighth Air /124
Army -- the 268th and 269th Fighter Air Divisions, commanded by Colonels B. A. Sidnev and I. P. Laryushkin -- involved in covering our defensive troops in the regions of Abganerovo and Tingut, but the 102nd Air Defense Fighter Division was also used.

Fighters from the 206th and 226th Assault Air Divisions under the command of Colonels V. A. Sryvkin and M. I. Gorlachenko and the 270th Bomber Division under the command of Colonel A. S. Yegorov flew three to four missions daily. To increase the effectiveness of our actions against the enemy, our bombers and assault aircraft began to practice strikes in large groups. Such tactics fully justified themselves: the Nazis suffered high losses in their tanks, cannons and personnel, the rate of their advance decreased and losses of our own aircraft dropped.

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The enemy's deep break-through in the regions of Stalingrad and the Caucasus made the situation substantially worse. Soviet troops were forced to

retreat with fierce battles and heavy losses and relinquish rich industrial and agricultural regions to the enemy. As a result, the People's Commissar of Defense of the USSR in an order numbered 227 dated 28 July 1942, in analyzing the dangerous situation which had developed to the south of our country, incited all our fighting men to increase resistance to the enemy and forestall his advance. "Not a step backward!" -- such was the demand by the Party, the Soviet government, and the homeland.

Political meetings and Party and communist youth gatherings were held in all units and commands, and individual get-togethers went on to study the order and put it into action. In the pages of Army and Division newspapers, columns were printed listing the best rifle marksmen, tank drivers, artillerymen, or fliers, and urging steadfastness among our fighting men in carrying out the demands of their military oath of allegiance. Communists and communist youth league members, as always, were in the first ranks of the selfless fighters. Their bravery and courage brought them the admiration of all personnel.

In those days, the entire country knew of the master of bombing strikes, the communist V. S. Yefremov, commander of the air squadron of the Tenth Guard Bomber Air Wing. In protecting his native Stalingrad, he and his comrades in arms bravely fought the enemy. On 16 August 1942, Captain Yefremov, heading nine bombers, received the order to destroy the crossing at the Don. On the approach to the target our bombers encountered four Messerschmidts. In the ensuing skirmish Captain Yefremov downed a German fighter. At the river crossing, the enemy opened up an avalanche of fire with their antiaircraft cannons and machine guns. Shells were bursting all around. Nevertheless, the /125
Soviet bombers dropped their bombs accurately right on target. The bridge's girders flew into the air, several tanks were blown up and infantry were scattered in all directions. On the next day, the same unit managed to blow up yet a second crossing.

During the defensive battles, Captain Yefremov flew more than 70 combat missions and destroyed dozens of tanks and other enemy equipment. For his outstanding successes in the battles at Stalingrad, he was awarded the Order of Lenin, and subsequently was twice awarded the Rank of Hero of the Soviet Union. After the war his thankful fellow townsmen erected a bronze statute of this famous flier in the city park.

Over the Don Steppes, fierce aerial combat was going on. There were 15 to 20 encounters each day, each of which would involve up to 50 or 60 aircraft. Soviet fliers demonstrated examples of courage, heroism, and high combatant skill in battling against the hated enemy. On 6 August, First Lieutenant M. D. Baranov, flight commander of the 183rd Fighter Air Wing and a communist youth league member, in flying cover over the crossings on the Don River, bravely led four Yak fighters into battle against 25 enemy aircraft. In this unequal encounter he downed a bomber and three fighters, one of which he destroyed by ramming. On 12 August, Baranov was awarded the Rank of Hero of the Soviet Union.

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M. D. Baranov

Equally brave were the fighter pilots V. D. Lavrinenkov, A. V. Alelyukhin, Amet-Khan Sultan, and P. Ya. Golovachev, who were subsequently twice awarded the Rank of Hero of the Soviet Union. Hero of the Soviet Union V. G. Kamenshchikov, in selflessly protecting his native city and his beloved Volga, engaged 16 enemy aircraft in aerial combat.

Our Air Force fought the enemy not only in the air, but on the ground as well. On 10 August, groups of assault aircraft from the 206th Assault Air Division put seven enemy aircraft out of operation at the Ol'khov air- /126
field. On 12 August, 29 aircraft from the 228th Assault Air Division (commander: Colonel V. V. Stepichev) destroyed or damaged up to 60 aircraft at the Ol'khov and Podol'khov airfields. Equally successful were our strikes against the airfields at Surovikino, Oblivsk, and Aksay.

The large extent of the Stalingrad front (700 kilometers) created great difficulties in commanding troops. In this context, the necessity arose of dividing the front into two smaller fronts. On 5 August the Stalingrad and southeast fronts were formed. The Eighth Air Army was put at the command of the southeast front, while the 16th Air Army under the command of General S. I. Rudenko formed part of the Stalingrad front.

In spite of heroic resistance, under the onslought of overwhelming enemy forces our troops had to withdraw to the eastern bank of the Don and deploy themselves in external defensive formation.

In connection with this withdrawal of troops, our air units had to shift their bases frequently. The engineering and airfield battalions, having little equipment for mechanized construction work, could not prepare an airfield network. Active aid was required by Party and Soviet organs, and the local population had to be drawn upon for a labor force in constructing the airfields.

On 17 August, fighting began at the near outskirts to the city. From this day on, units and commands of the Eighth and 16th Air Armies constantly attacked the enemy's troops and equipment, which were being forted across the Don. Our bombers' combat operations against the crossings went on day and night in accordance with a specially worked-out plan.

On the morning of 23 August enemy troops, having forced the Don, began the offensive in the general direction of Yerzovsk and Orlovka and, by the end of day, had broken through to the Volga.

On the same day, squadrons from the Fourth Air Fleet undertook the barbarian bombardment of Stalingrad. They flew more than 2,000 missions against the city in days. Soviet fliers and antiaircraft gunners displayed high organization, combat skill and adamantine will to victory. The sky over the Volga was an arena of heroic combat by our aviators. Six fighters under the command of Captain I. P. Motornyy engaged 65 enemy aircraft in battle. With precise bursts of fire, the heroic fighters downed five aircraft, while suffering no losses themselves. In all, during this day Soviet fliers and antiaircraft batteries downed 90 enemy aircraft over Stalingrad [142].

The break in the defenses and the enemy's approach to the Volga north of /127
Stalingrad made the situation substantially worse for our forces. General Headquarters demanded that we throw decisive thrusts against the enemy's groupings which had broken through, and not allow them to gain entrance to the city.

Starting on 24 August, groups of Soviet dive-bombers and assault aircraft, which the Nazis called "black death," ceaselessly waged attacks against the German troops. The Nazis suffered substantial losses due to their strikes. At night, Nazi troops which had been sprinkled among the ravines were destroyed by bombers of the 272nd Bomber Air Division under the command of Colonel P. O. Kuznetsov.

Soviet fliers did not spare their lives in combat with the enemy. We shall always remember the names of the fliers Major V. V. Zemlyanskiy, Battalion Commissar I. P. Zazulinskiy, First Lieutenant M. A. Presnyakov, and sergeant I. P. Vedenin, who emulated the immortal feats of Captain Gastello.

By their active operations, Soviet troops and aviation made the blood flow from enemy groupings which had broken through to the Volga and forced them to assume the defensive in the early days of September.

But the lull did not last long. By mid-September, the enemy had begun his assault of Stalingrad. The streets and squares of the city became fields of combat.

Battles in the city demanded great concentration, precise action, and wariness from our fliers. In the smoke of fire-torn cities and among the labyrinthian city streets it became difficult to track targets and almost impossible to recognize the front line. Therefore, the slightest error might bring fire down upon our own troops. Our assault fighters, hardly clearing roof tops, dropped their deadly loads on enemy strong points and firing points with accuracy within several meters. Along with artillery and tanks, they aided our infantry troops in driving the Nazis out of individual buildings.

During the defensive engagements, the organization of coordination between aviation and ground troops improved. Air Force representatives were constantly delegated to the combined-arms army command points. With their radio means of communication, they rapidly notified their air army commander or second in command of support requests from combined-arms commanders for air action against newly established targets. At the same time, the air army commanders moved

their command points closer to the areas of troop action. In the Eighth Air Army, an auxiliary command point was organized not far from the command point of the front-line troop commander, while the main command point was shifted to the region of the air unit bases. From this auxiliary command point, the army commander or his second in command could personally take charge of combat actions by aviation, coordinating its strikes with ground troop missions. /128

During the period of the battles for the city, the operation of Soviet aviation against the enemy improved in nighttime action as well. The Po-2 aircraft operated faultlessly at night. Silently and at low altitude, our fliers of small-engine aircraft sneaked up upon previously located targets and dropped small bombs against the Nazis. Frequently enemy attacks, being prepared at night, would be broken up by the operations of our Air Force. This was the case, for example, on 27 September, when fliers from the 272nd Night Bomber Air Division used forestalling strikes to break up enemy troop attacks in the valley of the Tsaritsa River and in the region of the Mamayev barrow.

Operations by our Air Force also became more active against enemy airfields. Whereas in July-August only 1/2% of all combat missions were flown against airfields, by September-October it was 4-5%.

By late October, units from the Eighth Air Army and the long-range Air Force carried out a special aerial operation to destroy enemy aircraft at their bases. The operation was planned and carefully prepared for earlier. On the day of 28 October, fliers from the 270th Bomber and 206th Assault Air Divisions attacked five airfields (Tuzov, Pkarpovka, Prudboy, Nizhne-Gumskiy, and Aksay), where four aircraft were set afire on the ground and seven Junkers and five Messerschmidts were destroyed during takeoff. On the night of 28 and 29 October, long-range bombers from the 24th, 53rd and 62nd Air Divisions, commanded by Lieutenant Colonel B. V. Bitskiy and Colonels I. V. Georgiyev and G. N. Tupikov, along with the 272nd Night Bomber Air Division, flew strikes against eight enemy airfields Flying 502 missions, they destroyed 20 German aircraft, created more than 74 fire centers, and set off 13 large explosions [143].

The 16th Air Army also operated actively against enemy airfields. On 2 November, its units destroyed and damaged up to 60 enemy aircraft at the Morozovskiy Airfield.

Nazi aviation was loosing more and more aircraft both on the ground and in the air. The Soviet Command formed within the 16th Air Army several wings of its best fighter pilots, who had obtained combat experience in the battle for Moscow and at other sectors of the Soviet-German front. One of these wings -- the 434th Fighter Wing -- was commanded by Hero of the Soviet Union Major I. I. Kleshchev. The wing was equipped with new Yak-9 aircraft. In only one day, the glorious Soviet eagles downed 34 Junkers. This wing did not have a single pilot who did not have at least several downed aircraft to his credit. The wing commander himself had downed 22 enemy aircraft. /129

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In the battle for Stalingrad, our aviators showed massive heroism. On

8 September, technical sergeant B. M. Gomolko, a flier in the 520th Fighter Air Wing, was carrying out his first combat mission, when he bravely engaged in combat with ten Nazi bombers and downed two of them, one by ramming. With his aircraft damaged, the pilot bailed out. Gomolko proved himself to be a brave fighter on the ground as well. He killed one Nazi flier who had landed one of the bombers Gomolko had downed, and captured the other.

On 14 September, seven fighters headed by Major I. N. Stepanenko boldly attacked 30 bombers covered by 12 fighters. In the ensuing air battle, the group commander downed three aircraft, and the other fliers forced the enemy to hurriedly drop his bombs and turn west.

For his combat feats in battle with the enemy in the air, Major I. N. Stepanenko was subsequently awarded two Gold Stars of Hero of the Soviet Union.

V. N. Makarov, I. P. Motornyy and Z. V. Semenyuk.

The names of Major Z. V. Semenyuk and Captain V. N. Makarov, fliers from the 512th Fighter Wing who downed 29 enemy aircraft on the aerial approaches to the Volga, are commonly known. These men were awarded the rank of Hero of the Soviet Union. /130

There is no number to the feats carried out daily by Soviet aviators. To fight the enemy until full victory became the law for our fighter pilots. When there was not enough ammunition, they would ram the enemy. Soviet fliers made 16 ramming strikes over the Volga stronghold. Among the brave were Captains S. D. Ludanskiy, V. V. Siroshtan, P. T. Tarasov, First Lieutenant I. I. Kobyetskiy, and others.

The case-hardened strength instilling steadfastness and tenaciousness in our Air Force personnel during battle was attributable to the communists and

communist youth league members, whose numbers were constantly growing through the fliers, navigators, gunners, technicians and other airmen who distinguished themselves in battle. In units of the Eighth Air Army alone, during the period of the heavy defensive battle at Stalingrad 1,684 men were admitted into the Party [144].

Cover Page Title

The air battle over the Volga took unprecedented dimensions. During the battles within the city alone the enemy lost 929 aircraft [145]. The Nazi command had to shift its short-range Eighth Air Army and many air units here from other sectors of the front. Nevertheless, the enemy's forces were daily drained away, whereas at the same time our Air Force grew in both numbers and strength.

The Soviet aircraft industry, picking up the rate of its production of aircraft, sent more and more aircraft to the front with each passing month. In 1942 our Air Force was receiving a monthly total of 2,260 aircraft, i.e., 510 aircraft more than in the second half of 1941 [146]. Therefore, our general headquarters was able to strengthen our air groupings in the region of Stalingrad, and gradually the ratio of air strength shifted to our favor. In three months (September-November) the Eighth Air Army alone received 984 new aircraft. The 16th Air Army as well was being reinforced with new equipment. In November it had already 300 aircraft.

Cover Page Source

On 18 November,1942, the defensive period of the battle of Stalingrad came to an end. In 125 days of defensive encounters the best Nazi divisions had been threshed over, and the necessary conditions had been created for the Red Army's turn to the counteroffensive. Supporting the ground troops, during the defense, the Soviet Air Force had flown 77,000 combat missions and dropped approximately 23,000 tons of bombs on the enemy. The enemy suffered substantial losses from strikes by our Air Force. In aerial battles and at his airfields, Soviet fliers destroyed over 21,100 aircraft. /131

The Communist Party and the Soviet government highly regarded the heroism, fortitude and high combat skill of the Soviet aviators. Twenty three air wings were granted the rank of Guard wings. From only 17 July to 1 October 1942, six fliers of the Eighth Air Army were awarded the Rank of Hero of the Soviet Union, and hundreds of aviators were awarded Orders.

* * *

The first period of World War II, which had lasted almost a year and a half, had been decidedly difficult for all the Soviet Air Force as well as for the country's armed forces in general. Especially difficult had been the first days of the war, when our airfields suffered surprise attacks by Nazi aircraft. The Soviet fliers entered combat with the enemy under the most unfavorable circumstances, but they did not hold back but rather showed the aggressor fierce opposition, and demonstrated their high discipline, self control, and fortitude.

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In battle for our homeland they dealt the enemy grave losses in both personnel and equipment and thereby made a valuable contribution to creating the preconditions necessary for a radical shift in the course of World War II. One hundred and seventy thousands tons of bombs were dropped on the enemy. In aerial battles, on the airfields and from antiaircraft fire the enemy lost 15,750 aircraft.[147] By the end of the first period of the war, the enemy Air Force's activity had dropped off. Conditions had been readied for the Soviet Air Force to seize strategic air superiority in this next, second period of the war.

The Soviet Air Force in conjunction with air defense units had prevented the distruction of Moscow and other major industrial, administrative and political centers of the country, and had successfully given air protection for Leningrad and its sole line of communication with the country -- the ice life line.

In the fierce battles during the first period of the war, each day saw the combat skill of Soviet aviators increase and improve, the ranks of aerial fighters fill, and the number of skillful masters of bombing and assault strikes multiply. The air commands and headquarters had obtained rich experience in controlling units and formations under the difficult conditions of ground and aerial situations. /132

Cover Page Source

The service of the Soviet Air Force to its homeland in battle against the Nazi German interlopers during 1941 and 1942 is given cogent acknowledgement through the fact that 258 fliers were awarded the Rank of Hero of the Soviet Union, many thousands of aviators were awarded Orders and Medals, and 43 air units were changed to Guard units.

The Aerial Blockade

For almost a year and a half, the Soviet Union had engaged in fierce fighting against Nazi Germany and its satellites. The situation in our country by the autumn of 1942 was quite serious. The enemy had broken through to Voronezh, the lower courses of the Volga, and the Caucasus. His troops were 150-200 kilometers from Moscow, and were besieging Leningrad. The situation got even worse, in point of fact, because the USSR alone bore the entire weight of the war with the countries of the Nazi coalition. The ruling fractions in the USA and England were in no hurry to open a second front in Europe.

However, the difficulties created by the situation did not subdue the determination of the Soviet people. They courageously continued their heroic struggle astounding the world with their steadfastness and fortitude. Their resistance to the enemy grew from day to day.

The Soviet Air Force itself had been substantially strengthened by the beginning of the second period in the war. Now we were equipped primarily with new types of aircraft (Yak-7b, La-5, Il-2, and Pe-2). The successful development of the Soviet aircraft industry and the support of the Red Army in the form of a constantly increasing number of aircraft was the beneficial result of the further improvement in the organizational structure of the Air

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Force. In October of 1942, air corps (bomber, assault, fighter and combined) began their formation from general headquarters reserves. The existence of powerful reserve air units permitted the command to mass on a large scale the strength of the aviation in the major direction and constantly support the combat missions of ground troops.

With the increase in the numbers of our aircraft, the organizational structure of the air wings also changed. Their components increased from 20 to 32 aircraft each.

The equipping of our fighter aviation with new and faster aircraft (La-5, Yak-7b, and Yak-9) with improved armament and better maneuverability made it possible to shift from flights of three aircraft to flights with two pairs each. It is true that pairs of aircraft as a basic combat formation had incidentally been used earlier. However, this had been only in those wings where they had Lag-3, Mig-3 and Yak-1 aircraft. Now, however, when all the fliers in our fighter Air Force were to fly new aircraft, the pair was legitimized by the new Tables of Organization. Thanks to such organization, the aircraft's in-flight maneuverability had been improved, its fire-power had been increased, and it had become more reliable for mutual cover both within the pairs, and in the flight as a whole. /133

The La-5 Fighter

With the appearance of new types of aircraft, the picture of the war in the air changed. The increased rate-of-climb in our fighters permitted the broader use of maneuvers in the vertical plane, and a switching to a more active offensive type of operation. Combat formations of aircraft were based on the echelon with respect to altitude, front, and depth, thanks to which conditions improved for seeking out, intercepting, and destroying the enemy in the air.

By comparison with December of 1941, our front-line aircraft pools had almost tripled in numbers of aircraft by the beginning of the second period of the war. This now included approximately 4,000 aircraft of strictly new design [148].

At that time, the German Air Force, along with its satellites, numbered 3,300 combat aircraft on the Soviet-German front [149]. More improved modifications of German fliers -- the Me-109f, Me-109g-2, Me-109g-4 -- and entirely new aircraft -- such as the FW-190 -- began to reach the front. At the same time, by autumn of 1942 the flight personnel of the Nazi German Air Force had been substantially weakened. Young fliers who had undergone hurried training courses were arriving to replace those experienced fliers who had been killed in the war. As a result of this, and also in view of the heavy losses in aircraft, by the beginning of the second period of the war the Nazi Air Force had lost its quantitative and qualitative air supremacy, and its activity sharply dropped off. /134

In the winter of 1942/1943 the Soviet Command decided to launch an all-out offensive in the southern wing of the Soviet-German front and to subsequently carry out series of offensive operations on the western and north-western sectors.

Those sectors of the south-western, Don and Stalingrad fronts which were to take part in the counteroffensive included the 17th, 16th and Eighth Air Armies (commanders: Generals S. A. Krasovskiy, S. I. Rudenko and T. T. Khryukin, respectively). Before the onset of combat operations, this air grouping was reinforced with air reserve units from the General Headquarters and the Second Air Army from the adjacent Voronezhev front (commander: General K. N. Smirnov). In overall numbers, our Air Force here totalled 1,414 aircraft, 426 of which were obsolete and used only in night missions. In his opposing Fourth Air Fleet, the enemy had 1,216 combat aircraft. Consequently, before the beginning of the counteroffensive our Air Force had no significant superiority in strength, and if we exclude the aircraft which could be used only at night, we were even lagging behind the enemy.

The intention of General Headquarters had been to send strikes by Soviet forces converging upon Kalach and Sovetskiy to first encircle and then destroy enemy groupings which had broken through to the Volga.

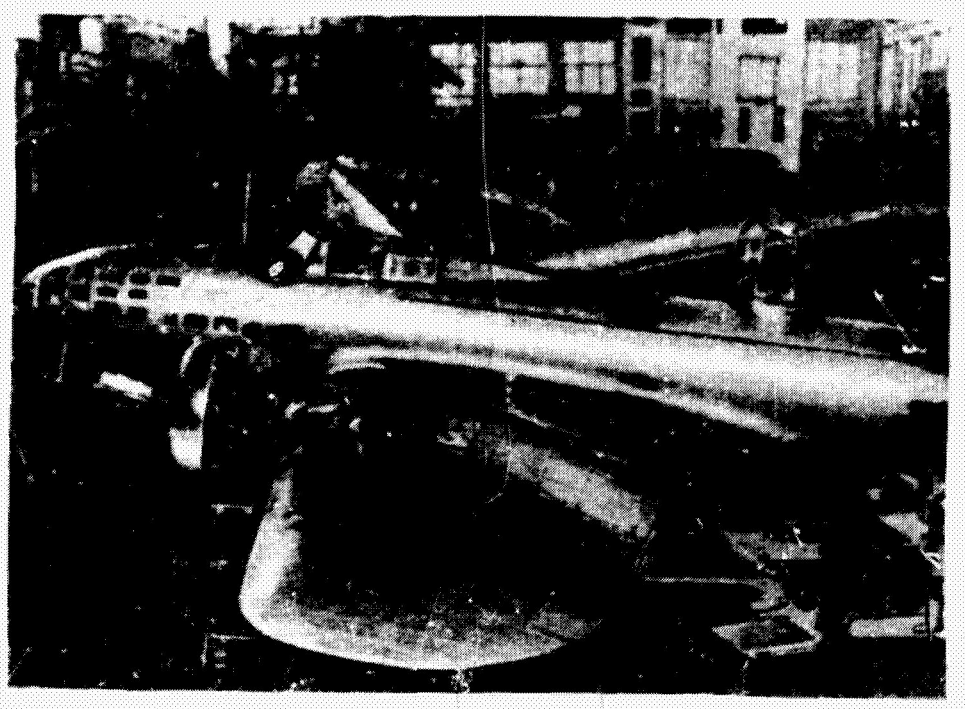
The Soviet Air Force was faced with these missions: to gain air superiority and reliably cover our ground troops from strikes by the enemy's Air Force, support our infantry and tanks when they were to break through the enemy's defenses, surround and destroy him outside Stalingrad, engage enemy reserves being brought up from the rear, and perform aerial reconnaissance.

To successfully carry out these missions, our air armies instigated tremendous preparatory work. With systematic visual observation and photography, our aerial observers uncovered groupings of enemy troops, their defense systems, their Air Force bases, and reserve dispositions. Our Headquarters carefully worked out the necessary operational documents, and broken down the combat missions to be carried out by our air units and commands in terms of order and priority.

The combat operation of our Eighth Air Army was planned initially in the form of an aerial offensive whose objective would include the constant aerial /135

support of strikes by groupings of our front-line forces in breaking through the enemy's defenses and achieving success.

In the autumn of 1942, patriotic movements sprung up across the country to collect funds in a Defense Fund. To hasten victory over the enemy, workers, laborers, collective-farm workers -- in fact all the workers of the Soviet Union -- added their contributions to building aircraft, tanks, and other combat equipment.



In an Aircraft Factory. Assembling Aircraft.

During these days, collective-farm workers from the Saratov region went to the Stalingrad front and presented the 291st Fighter Air Wing under the command of Hero of the Soviet Union Major V. I. Shishkin an aircraft bought with their personal savings. The aircraft was handed over under festive occasions. There was a meeting in the wing which culminated in a warm and touching meeting between the rear-area workers and the aerial combatants.

Later, in December of 1942, at the same front, a collective-farm worker from the Saratov region named F. P. Golovatyy presented an aircraft which he himself had bought to Major B. N. Yeremin, a former lathe operator in one of the Saratov factories. /136

Then, entire squadrons of aircraft with the enscriptions "Moscow", "Leningrad", "The Arkhangel'sk Communist Youth", the Soviet Littoral", "From the people of Uzbekistan", which had been built with the personal funds from workers, would make their appearance in the air armies. To fly and fight in these aircraft was a great honor for our Soviet fliers.

In those days, letters and greetings would reach our combat aviators from Soviet citizens, factory collectives, and collective farms from all around the

country; they would be read aloud or printed in the army papers. The rear-area workers' warm words and calls to strike harder at the enemy brought out patriotic feelings in our combat aviators and strengthened their faith in victory. In their answers to the workers' letters, the Soviet aviators swore to strike the enemy mercilessly.

On the eve of the counteroffensive, meetings were going on in the air units. In a mood of celebration and under unfurled banners, our fighting aviators heard the firey speeches of their commanders and commissars, Party and communist youth leaders, and the vows of their comrades.

On the morning of 19 November 1942, salvoes from many thousands of Soviet guns heralded the beginning of the counteroffensive. It was begun first on the southwest and Don fronts, and a day later at Stalingrad. Breaking through the enemy defenses, in five days troops on the southwest front had advanced 160 kilometers and liberated the town of Kalach. The troops on the Stalingrad front, hitting the enemy from the south, had by this time advanced 115 kilometers in battle and, having freed the village of Sovetskiy, on 23 November joined with the tank corps of the southwest front. The enemy's more than 300,000-man army was surrounded. In the first days of the counteroffensive, our Air Force's combat action was restricted by poor weather. Due to fog and low cloud-cover, our Air Force could not fully support our ground troops. Only single aircraft or small groups could operate. During the time the Nazi German troops were being encircled from 19 to 23 November, Soviet pilots flew a total of 970 missions. However, each of these missions was itself a feat, inasmuch as it was made under the most difficult weather conditions, at low altitude, and in the face of heavy enemy resistance fire. The appearance of our red-starred aircraft under such circumstances gave an even greater lift to our troops' offensive.

In addition to supporting troops on the battlefield, Soviet fliers struck against enemy airfields. On 21 November, six Il-2 aircraft commanded by the renowned fighter pilot and Hero of the Soviet Union Captain V. M. Golubev /137
flew behind enemy lines without fighter cover to strike at an airfield. Having crushed the fire from enemy antiaircraft batteries, the brave six destroyed six Nazi aircraft. In returning from their target, the assault aircraft were attacked by enemy fighters. In the resulting aerial duel, our fliers downed two Messerschmidts and returned to their own airfield untouched.

The weather improved after 24 November, and our front-line Air Force substantially increased its activity. Daily our fliers would fly as many missions as they had flown throughout the first five entire days of the operation. They offered secure air cover for our advancing troops in the main directions, destroyed Nazi tanks, guns, and personnel in the battlefield, operated against airfields, and carried out aerial reconnaissance. In seven days (from 24 to 30 November) they flew 5,760 combat missions.

In December, the Nazi command decided to attempt to relieve the blockade of its encircled grouping. Large enemy troop elements were concentrated along the external front of the encirclement and launched an offensive. Intense

fighting broke out which involved not only ground troops, but the Air Force as well. Large air units from the Eighth Air Army flew precise strikes day and night against enemy tank and infantry divisions which were attempting to ram through our defense and break through to Stalingrad. At the critical moment, when the corridor separating Paulus's Sixth Army from Mansteim's advancing army had been narrowed to 50-40 kilometers, the commander of the Eighth Air Army issued an order to his men: "Twenty December will be a day of decisive battle in terms of destroying the enemy's tank grouping which had broken through. The War Council of the Stalingrad front calls for especially intensified efforts from all the members of the Eighth Air Army in destroying the enemy from the air in close coordination with our front-line troops. Each assault and bomber mission must inflict as much damage as possible to the enemy "[150]. And our fliers, with continual strikes from the air which went on from 20 to 23 December, helped our ground troops stop the enemy on the banks of the river Myshkov. In four days they had flown 758 combat missions.

At this time, however, the 16th and parts of the Eighth Air Armies did not curtail their operations against the encircled enemy. Their strikes on 18 December were especially successful and timely; it was at this time that Paulus's troops had been preparing to join up with tanks and motorized divisions which had broken through the outside encirclement front. On that day, 74 Pe-2 /138 bombers from the Second Bomber Corps (commander: General I. L. Turkel') and ten Il-2 aircraft from the 228th Assault Air Division (commander: Colonel G. I. Komarov) under the cover of 28 Yak-1 fighters from the 220th Fighter Air Division (commander: Colonel A. V. Utin) flew a concentrated strike against a massing of a large group of enemy tanks and infantry in the region of Karpovka. The effectiveness of this strike was extremely high. Suffering heavy losses, the enemy troops lost all hopes of breaking out of their encirclement.

To once and for all dispel enemy hopes of breaking through to their surrounded grouping, on 16 December troops from the southwestern front launched an offensive against the outer encirclement front. On the first day of the operation, air units supporting them flew strikes against enemy resistance centers and troops in the region of Tverdokhlebovka, Radchenskoye, and Boguchar, as well as against the Tatsinsk and Morozovsk airfields. By late December, the outside encirclement front had been reduced to 100-150 km.

Combat operations of the 17th Air Army during that period were highly praised by the ground forces commanders. The commander of the Third Guard Army, General D. D. Lelyushenko noted: "From 16 to 18 December 1942, they performed outstandingly, as is supported by numerous facts and testimonials: a) the commander of the First Guard Mechanized Corps wrote: "They gave outstanding cover to our jump-off positions, access to them, 'lead-in's to the breech, and the battlefield"; b) prisoners reported: "Your Air Force dealt our troops heavy losses, especially at Bokovskaya, where they never let us rest"; and c) as a result of the coordinate of ground troops and the Air Force, Astakhov, Bokovskaya, and Vislogubov and others were liberated "[151].

In all, during the operation on the southwest front, the Second and 17th Air Armies flew 4,177 missions. Our fliers downed 154 aircraft in aerial combat and knocked out 136 at airfields. Our losses were 172 aircraft.

The Soviet winged warriors, without sparing their efforts or even their lives, boldly and accurately struck the enemy down. On one short December day, four Il-2 aircraft from the 808th Assault Air Wing in which H. Abdirov was serving flew a combat mission.

Approaching the target, the fliers launched into diving attacks and dropped their death-dealing load on the enemy troops. The enemy antiaircraft batteries opened fire. On the second pass, Sergeant Abdirov's aircraft was downed.

The flier understood that he could not make it back to his own lines, and to bale out would mean to fall enemy to the Nazis. At this point, that true /139
son of the Soviet people Kazakh Abdirov aimed his aircraft into a concentration of enemy tanks. For this feat, communist Nurken Abdirov was posthumously awarded the Rank of Hero of the Soviet Union.

At the same time as attempts were being made to lift the encirclement of Paulus's grouping, the Nazi command was organizing air lifts to supply it. General Goering, the German Air Force Commander in Chief, boastfully assured Hitler that the aerial bridge to the encircled troops would daily supply them a minimum of 300 tons of supplies. Almost the entire efforts of their transport Air Force were assigned this task. Out of schools, from training commands, from their air lines networks -- from everywhere they gathered their most experienced fliers and Ju-52 and Ju-86 aircraft. In addition, He-111 bombers were equipped to transport supplies.

The Soviet Command organized an aerial blockade of the surrounded grouping. Powerful fighter and antiaircraft covering detachments were created along the enemy aircraft approach routes. The battle with the transportation Air Force was extremely active. Beyond the outside encirclement front, Nazi aircraft were destroyed primarily at the airfields of Tatsinskaya, Morozovskiy, Sal'sk, Zverevo, Shakhty, Voroshilovgrad, Novocherkassk and Rostov. The Eighth and 17th Air Armies, the long-range aviation and units of the northern Caucasus front operated against these airfields.

Especially successful was the strike against the Sal'sk airfield, where the enemy had concentrated more than 300 aircraft, half of which were transports. In early January 1943 this airfield had become the main aerial supply base for Paulus's army. Twice fliers from the 622nd Assault Air Wing had attempted to attack it, but both times they had been repulsed: the airfield was covered by fighters and large numbers of antiaircraft batteries. Then it was decided to attack it by surprise at hedge-hopping altitudes. The best fliers were gathered from the entire wing to carry out this tricky combat mission.

On the morning of 9 January, seven Il aircraft headed by the renowned master of assault attack Captain I. P. Bakhtin took to the air and headed west covered by seven Yak-1 aircraft from the 236th Fighter Air Wing. Passing over the front line, the assault fliers dropped even closer to the ground so as to approach unnoticed. Soon the outlines of the airfield structures could be

made out. The airfield, completely jammed with aircraft, presented itself to the fliers' gaze. Field tanks and trucks were scurrying along the runways, and along the edge of the field piles of boxes and bags with supplies could be made out. Ignorant of the approaching danger, the Nazis continued their pre- /140
parations for flight. But suddenly at that instant our brave seven pounced upon the airfield like a storm, deafening the surrounding area with the roar of its engines and the fire from its cannons and machine guns. After the first attack, several columns of black smoke rose to the sky -- transport aircraft and fuel tanks exploding. In 15 minutes the assault aircraft made five runs. One attack followed the other, and after each of them more and more aircraft burst into flame. Finally on the third pass, the enemy antiaircraft batteries came to their senses and opened fire. Two of our Il-2's were downed, but their pilots, making forced landings, later returned to their units. In this audacious and tactically constructive strike, 72 German aircraft and several fuel tanks and trucks were destroyed and many soldiers and officers were killed [152]. For this highly successful strike against the airfield, all the crews in the group were granted government awards. Subsequently the fliers Ivan Bakhtin, Vladimir Opalev, Aleksandr Dubenko and Vladimir Dogayev were awarded the Rank of Hero of the Soviet Union.

An Enemy Airfield after a Strike by Our Air Force.

The enemy suffered heavy losses not only at his airfields, but in the air as well. Between the outside and inside encirclement fronts, German aircraft encountered heavy opposition by our fliers. To intercept enemy planes, our fighters patrolled the air, taking off when alerted. Thus, on 11 December 1942 /141
in the region of Bol'shiye Chepurniki, 18 Soviet fighters headed by I. D. Podgornyy, commander of the 235th Fighter Air Division, attacked 16 Ju-52 aircraft flying supplies to the encircled region. With cannon and machine gun fire our fliers downed 15 enemy aircraft, and captured eight fliers from the downed aircraft.

On the edge of the encirclement region we set up our antiaircraft

batteries. Here in a band 8-10 km wide, our fighter pilots destroyed aerial targets through close coordination with our antiaircraft batteries.

A few enemy aircraft did succeed in breaking through to the surrounded grouping. However, even there our fliers did not leave them in peace. They destroyed the enemy's transport aircraft both in the air and on the ground. Po-2 light bombers flew at night to blockade the airfields and landing fields within the encirclement region. Flying barrage over the enemy airfields, they would periodically drop small bombs and destroy aircraft which had landed there.

In January, when the amount of supplies being transported by air had substantially dropped off, E. Milch, the inspector general of the German Air Force, arrived at the Headquarters of the Fourth Air Fleet under the personal auspices of Hitler. He mobilized all the best efforts of the Air Force to hasten the delivery of provision, ammunition, and fuel to Paulus's troops. However, in the words of Nazi General K. Zeitzler, suppling the surrounded army was "beyond the powers of the German Air Force "[153].

During the aerial blockade, approximately 1,160 enemy aircraft were destroyed, three quarters of these at the airfield [154]. The German Air Force at that time was in need of many more trained fliers. In his post-war memoirs, the former Nazi officer Hans Dörr has acknowledged: "Not only our ground troops, but our Air Force as well lost an entire army at Stalingrad "[155].

Isolated by both air and ground, Paulus's army was suffering severe shortages of ammunition and fuel, and was existing on cold rations. The combat capability of the troops dropped catastrophically.

On 10 January 1943, when the Nazi command rejected an ultimatum of capit- /142
ulation, troops from the Don front launched an all-out offensive after aerial and artillery prepping. The 16th Air Army, constantly supporting the advancing units, flew approximately 700 missions in the first day. Its air units dealt powerful strikes against centers of resistance, troop concentrations and enemy headquarters, as well as blockading its airfields at Bol'shaya Rossoshka and Pitomnik. The enemy troops resisted, but their situation got worse with each passing day. On 2 February 1943, the surrounded enemy grouping was completely liquidated.

In evaluating the operation by the air units of the 16th Air Army in carrying out their missions in the interest of the 65th Army, General P. I. Batov wrote in his order dated 29 January 1943 that "through its bold assault attacks and outstanding bombing of the enemy's combat troop formations and his centers of resistance, the fliers paved the way for successfully carrying out our missions of completely destroying and eliminating the surrounded enemy forces "[156].

Along with the 16th Air Army, long-range aviation also took part in destroying the surrounded troops. Especially active air divisions were the 50th (commander: Colonel S. S. Lebedev), the 24th (commander: Colonel B. V. Bitskiy), the 62nd (commander: Colonel G. N. Tupikov), the 53rd (commander:

Colonel I. V. Georgiyev), and the First (commander: Colonel V. Ye. Nestertsev).

In its counteroffensive at Stalingrad, the Red Army destroyed one of the most powerful of the enemy's groupings. The Soviet Air Force made a substantial contribution to this victory. Achieving and maintaining air supremacy, it made it possible to carry out this fast strategic operation successfully.

During the period of the counteroffensive, the fliers from four air armies and long-range aviation units flew approximately 36,000 missions and dropped 141 thousand bombs. Through their well-aimed strikes, the Soviet fliers rought great losses to the enemy troops and substantially weakened their aerial groupings.

The successes by the Soviet Air Force in the battle on the Volga were made possible by the high morale of our aviators, their dedication to their homeland and the Communist Party, their massive heroism, the improved quality of Soviet aircraft, our fliers' skill, and the ability of our air commanders and headquarters.

For their combat achievements, in the Eighth Air Army alone over 3,000 /143
aviators were awarded medals and orders. Seventeen fliers were given the Rank of Hero of the Soviet Union. Ten air divisions (the 220th, 268th and the Tenth Fighter Divisions, the 228th and 226th Assault Divisions, the 272nd Night Bomber Division, and the Third, 17th and 24th Long-Range Bomber Divisions) were made Guard units. Two air corps, 12 divisions, and 21 wings received honorable commendations.

The victories achieved by the Soviet Armed Forces on the Volga radically altered the situation on the Soviet-German front. Favorable conditions had now been created for the massive expulsion of the invaders from our country's borders. Taking advantage of the success achieved, our General Headquarters organized an offensive in the northern Caucasus, the Donbass, at Kursk, Khar'kov, Smolensk and Orlovsk-Bryansk, and outside Leningrad. By March 1943, the Red Army had thrown the enemy back at individual points up to 600-700 km.

The Soviet Air Force during this time flew over 110,000 missions [157]. The enemy suffered tremendous losses in both his troops and equipment due to strikes by our Air Force. The enemy Air Force lost its best pilots as well as large numbers of support personnel. To fill these ranks, the Nazi command was forced to shift air units from Germany, France, Holland, Norway, the Balkan Peninsula, and the Mediterranean Theater of combat operations to the eastern front.

In the Sky Over the Kuban'

By late March 1943, the Red Army's strategic winter offensive had ended. The troops were preparing for new operations: moving up the rear areas and filling the ranks with reserves. Activity of combat operations on the Soviet-German front had markedly fallen off. Only to the south of our country, in the lower reaches of the Kuban' and on the Taman'Peninsula, did fighting continue.

Having established a strong defense here, the Nazi German troops were putting up stubborn resistance and attempting to divert the attention of the Soviet Command from the offensive being prepared at Kursk and retaining a bridgehead for a possible offensive to the Caucasus.

To destroy any such enemy intentions, General Headquarters ordered the troops on our northern Caucasus front to revert to an offensive and destroy the enemy grouping dispersed at Taman'.

The Nazi command attempted to compensate for its lack of ground troops /144
by intensifying the activity of its Air Force. A powerful air grouping was concentrated in the Crimea and on the Taman' Peninsula. With its aid, it was hoped that our troops' advance could be forestalled and an air-borne group in the region of Myskhako (south of Novorossiysk) could be destroyed. To support his 17th Army on the defensive on the Taman' Peninsula, the enemy sent units from his Fourth Air Fleet numbering approximately 1,000 aircraft.[158] The enemy fighter Air Force consisted of its best squadrons such as the "Udet", the "Melders", and the "Gold Heart".

Our Air Force on the northern Caucasus front, commanded by General K. A. Vershinin, included the Fourth and Fifth Air Armies (commanders: Generals N. F. Naumenko and S. K. Goryunov). The Black Sea Fleet Air Force was also enlisted for action with them. All together they numbered 1,147 aircraft. Two long-range air divisions with 78 long-range bombers were also operating in this area.

The broad extent and the especially criticality of the battle in the sky over the Kuban' justified the use of such large air forces on both sides.

Active battle in the Kuban' began on 17 April, when the Nazi German troops made an attempt to liquidate our beachhead in the region of Myskhako. After artillery and air prepping, the enemy began a powerful attack against our amphibious landing force. Against units of the 18th Army, which was defending the 30-km^2 beachhead, the enemy threw 450 bombers and 200 fighters. With each hour it became more and more difficult to repulse attacks by the enemy's superior forces. At the critical moment, however, the Malaya Zemlya sent fliers to the aid of these heroes. For three days (from 17 to 19 April) they fought an intense battle with the enemy's air and ground troops, inflicting heavy losses against him.

With each strike by our Air Force the enemy weakened, but he nevertheless pressed forward. Having brought up his reserves, at 1200 hours on 20 April he launched an all-out attack. At this time, the Air Force Command at the front sent 500 aircraft for combat in the region of Myskhako. At 1130 hours a group of aircraft including 60 bombers and 31 fighters flew the first concentrated strike against the enemy troops preparing for the attack. It proved so effective and unexpected that the enemy's attack got bogged down. A repeated attack by a group of 100 aircraft completely destroyed the chances of an offensive by enemy troops.

Comrades in Arms Greet A. I. Pokryshkin (center) upon His Being Designated a Triple Hero of the Soviet Union. August 1944.

Chief of the Political Section of the 268th Fighter Air Division Lieutenant Colonel Ya. V. Zubkov Presents a Party Card to Fighter Pilot V. D. Lavrinenkov (left). In the center -- P. Ya. Golovachev. 1942.

In evaluating the actions by our fliers, General K. N. Leselidze, commander /145
of the 18th Army, wrote: "The mass strikes by our Air Force against the enemy who was attempting to destroy our amphibious landing troops in the region of

After a Successful Combat Mission. 1943.

First Lieutenant M. I. Dolina, Group Second in Command and Hero of the Soviet Union, with Group Navigator Lieutenant G. D. Dzhunkovskaya, also a Hero of the Soviet Union. August 1944, First Baltic Front.

Myskhako destroyed his plans. Our landing troops felt confident in our ability "[159].

Operations by our Air Force increased even more in subsequent days. Making three to four sorties per day, Soviet fliers showed their great skill and heroism in battle. On 21 April, the crew of an Il-2 from the 805th Assault Air Wing was attacked over their target by four Nazi fighters. In the ensuing uneven engagement, pilot N. V. Rykhlin and gunner I. S. Yefremenko downed two enemy aircraft, while the others hurried back home. Severely wounded, the flier flew his aircraft to an airfield and landed safely. For his courage and bravery, Second Lieutenant Rykhlin was specially awarded the Rank of First Lieutenant, while technical sergeant Yefremenko was awarded that of Second Lieutenant. They were both awarded the Rank of Hero of the Soviet Union.

Under the strikes by our /146
Air Force, the enemy troops withdrew to their original position. The Nazi squadrons, having lost 182 aircraft in aerial encounters between 17 and 24 April, were forced to withdraw from the battlefield [160]. The first aerial encounter had been won.

The weakening of the enemy's air grouping was also brought about by night strikes against his airfields. From 17 to 29 April 1943, the enemy lost 260 aircraft destroyed or damaged at his airfields [161].

After several days of lull, fierce aerial encounters again broke out over the Kuban'. On the morning of 29 April, troops of the northern Caucasus front

launched an offensive to cut off the Crimea and Anapa with a strike and then destroy the enemy grouping at Taman'. On the night of 29 April, units from the Fourth Air Army[1] together with long-range bombers flew air prepping, during which they dropped 210 tons of bombs against enemy objectives. This carefully planned and well organized mission was flown without any losses of our aircraft.

That night's operations by the 46th Guard Night Bomber Wing (commander: Major Ye. D. Bershanskaya) were successful. Its female fliers and navigators flew precise strikes against the enemy's firepower on the outskirts of the Krynskaya station.

At 0700 hours, aircraft of the Fourth Air Army reappeared over the enemy positions. In group after group, they approached the battlefields and dropped their deadly loads on the enemy for three hours. Aerial cover of ground troops was well organized. German bombers attempted to halt the advance. In the morning, a group of Junkers attempted to fly a strike against our ground units, which were moving toward the front line. But at that instant, six fighters led by Dmitriy Glinka appeared in the sky. Face to face with a large group of enemy bombers, like a meteor the leader threw himself into their combat formation. First he downed the Junkers leading the group, and then he felled two more aircraft. Seeing the flaming bombers fall to the ground one after the other the remaining Nazis dropped their bombs before they reached their targets and headed back. The strike by 60 enemy aircraft had been disrupted.

Our troops did not succeed in breaking through the defense to its full depth. The enemy had fortified it with a second line. In spite of the fact that ground battles had gradually died down, the battle in the air went on with renewed vigor. Groups of aircraft would appear daily over the front line relieving each other, and the aerial encounters would last for hours. Over a relatively narrow 25-30-km sector of the front, up to 40 aerial battles involving 50-100 aircraft on each side would take place daily. /147

The intensity of the aerial battles continued until 10 May. In 12 days of combat operation, 368 enemy aircraft were downed [162]. On the average, the Nazi German Air Force lost 18 fighters and 12 bombers daily in these battles. Losses to the Air Force on the northern Caucasus front amounted to 70 aircraft [163].

On 26 May, the troops along the northern Caucasus front attempted to break through the enemy's second section of the main battle zone -- the "blue line." The attack was preceded by 40 minutes of aerial prepping, which ended by setting up a smoke screen. Then the bombers and fighters constantly supported the advancing troops. In six hours of battle, the infantry and tanks

[1] On 24 April, the command of the Fifth Air Army was attached to the Stepanov front, thereby shifting into its command air units of the Fourth Air Army, whose command was assumed by General K. A. Vershinin. The Air Force Headquarters for the northern Caucasus front was disbanded.

Even Roman odd

had broken through one sector to a depth of 3-5 km and had secured first and second positions.

A Strike by Pe-2 Bombers.

To eliminate the threat of a breakthrough in their defenses, the Nazi Command had resorted to aid by their Air Force. They had brought bomber squadrons from the south of the Ukraine to operate in the Kuban', with the result that he had secured a quantitative superiority in aircraft. As early as

the afternoon of the first day of the offensive, enemy bombers started to make their appearance over the battlefield in large groups. Our fighter pilots engaged them in battle. They disrupted their on-target bombing, while several groups of aircraft did not even reach their objectives, which were under cover. However, this lack of strength did not yield complete disorganization of their action. Experiencing strong operations in the air, our ground troops curtailed any further offensive.

Il-2 Assault Aircraft over Their Target.

Yugoslav Peasants Joyfully Greet a Soviet Flier.

The Party Bureau of the 46th Guard Bomber Air Wing (left to right): Ye. Ya. Rachkevich, Ye. D. Bershanskaya, N. S. Taraparevskaya, K. A. Il'yushina, O. S. Fetisova and M. I. Runt.

In the resulting situation, the commander of the Fourth Air Army threw almost all his fighter units against the enemy's bombers, and sharply cut back their details in covering our assault aircraft and bombers. In addition, our night bombers stepped up their strikes against the enemy airfields.

These measures made it possible to wrest the initiative in the air from the enemy. During the first days in June, the Nazi German aviation experienced a drop in its operations. The Soviet fliers again became masters of the sky over the Kuban'. /148

Having lost 315 aircraft in this concluding period in the aerial struggle, the enemy gave up his massed aerial assaults [164]. By 8 June, active battles on the ground and in the air had ceased.

The aerial engagement over the Kuban' had lasted more than two months. In terms of the number of aerial battles and aircraft participating in them, it had been one of the biggest engagements. From 17 April to 7 June 1943, our Air Force had flown approximately 35,000 missions [165]. The enemy had suffered great losses in both troops and equipment. His Air Force had suffered particularly heavy losses. Only one fighter air wing, commanded by Lieutenant Colonel I. A. Taranenko, had downed 112 enemy aircraft in combat over the Kuban'. In all, the enemy had lost 1,100 aircraft, 800 of which had been downed in combat [166].

In assessing the results of combat operations in the Kuban', the War Council of the northern Caucasus front stated in a decree dated 21 June 1943: "As a result of aerial engagements, victory indisputably remained on our side. The enemy could not achieve his target. Our Air Force not only successfully

resisted the enemy, but simultaneously forced the Germans to give up aerial battles and remove his Air Force "[167].

In the battles in the Kuban', examples of great skill and bravery were shown by such heroic fliers as D. B. Glinka, B. B. Glinka, V. G. Semenishin, V. I. Fadeyev, G. G. Golubev, A. F. Klubov; and the pilots and navigators from the women's bombers wings such as Ye. I. Nosal', M. P. Chechneva, V. L. Belik, Ye. M. Rudneva and many others.

The combat achievements and feats by these heroic fliers gave our people a feeling of admiration and pride. The name of fighter pilot A. I. Pokryshkin became widely known not only within our country, but abroad as well. The red-starred fighter which he flew brought terror to the enemy. One appearance by our renowned ace in the air would cause panic and fright among enemy fliers. Their vaunted pilots could not stand up under his impetuous onslaught. In the battles over the Kuban', Pokryshkin showed himself to be not only a fearless fighter, but a tactically well-versed commander as well, in addition to being an able leader of group aerial battles. His boldness and fine calculation, his constant seeking for new tactical measures, his striving to learn under any combat situations -- these were the basic characters of this flier, who was later to become a triple Hero of the Soviet Union. /149

The Flying Brothers B. B. Glinka and D. B. Glinka, The Kuban', 1943.

By the summer of 1943, the center of gravity of the battle in the air had shifted to the central sector of the Soviet-German front, where significant events were imminent. In preparing for their offensive in the region of the Kursk salient, the Nazi Command was gradually concentrating its most combat-ready ground troop and aviation units here.

To hold an even more serious threat against the enemy's Air Force and at the same time create favorable conditions for achieving air superiority, our General Headquarters organized combat activity against enemy airfields on a large scale. The strikes against the airfields, in combination with the fierce aerial battles, would take the form of aerial operations.

The first such operation took place in mid-May of 1943. Forces from the First, 15th, 16th, Second, 17th and Eighth Air Armies participated. The first strike against 17 enemy airfields simultaneously was spread over a 1,200-km sector of the front (from Smolensk to the Azov Sea), and was carried out on the /150
morning of 6 May. It included 434 aircraft from five air armies -- the First, 15th, Second, 17th, and Eighth. Nearby German fighter airfields were blockaded, and antiaircraft batteries manned by specially trained crews were designated for this.

Caught unawares, the enemy could not put up any organized resistance. Our fliers destroyed 194 aircraft at the airfields and downed 21 in the air, losing 21 aircraft themselves during the operation [168].

Repeated strikes against various German airfields were carried out from 6 to 8 May. To overcome growing enemy opposition, efforts were made to destroy their air defense capabilities as well as their numbers of fighter cover. Repeated strikes on 6 May put 158 aircraft out of operation, and on 7 and 8 May -- 133.

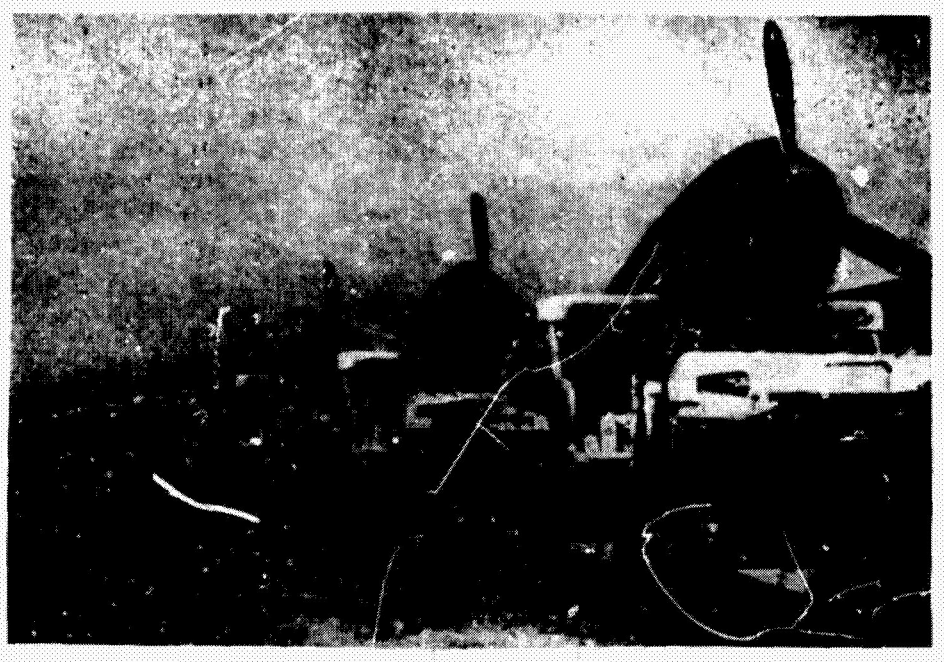
In all, during this operation, which lasted three days, strikes were flown against 20 German airfields. The enemy lost 429 aircraft on the ground and 77 in aerial combat. Our losses totalled 122 aircraft [169].

The high effectiveness of our strikes against the airfields was corroborated by subsequent aerial reconnaissance photography data and testimonies by captured German fliers. The Headquarters Commander of the underground movement in the western front reported to the commander of the First Air Army, General S. A. Khudyakov: "According to data from guerrillas, the strikes made by our Air Force on 6 and 7 May at the Seshchenskiy airfield set fire to five, destroyed four, and seriously damaged 16 enemy aircraft. Seventeen antiaircraft positions and four lights were destroyed and 200 Germans were killed or wounded "[170].

From 8 to 10 June, the second aerial operation was carried out. Strikes against 28 enemy airfields located primarily in the western, central, and Voroneshchev fronts enlisted the efforts of the First, Second and 15th Air Armies (commander of the Second Air Army: General S. A. Krasovskiy; and commander of the 15th -- General N. F. Naymenko), as well as long-range aviation units. The object of the operation was to weaken the enemy's bomber aviation capability which would facilitate his flying strikes against our railroad centers and important industrial centers -- Gor'kiy, Saratov, and Yaroslavl'.

In contrast to the May operation, the first massed strike by the three air armies was made not in the morning, but in the evening of 8 June. This time the enemy had kept his air defense in full readiness and put up stiff

resistance. Therefore, success was gained primarily by those units which operated in large groups. At night the enemy airfields were subjected to powerful strikes by our long-range aviation units, which flew 805 missions. They combined forces of the front-line and long-range air forces in the June operation destroyed 223 enemy aircraft [171]. /151



To the Front!

In May and June, the Nazi German Air Force flew a series of retaliatory strikes against our airfields. However, thanks to our careful camouflaging and dispersing of our aircraft on the fields, as well as our having created a large network of dummy airfields and having readied strong air defense, their effectiveness was quite low.

Equipping these dummy airfields had been quite a laborious affair, but the extent to which they were effective can be judged a single example. One such dummy airfield was built under the command of Major V. I. Luk'yanov, commander of the Camouflaging Service, in the region of the Second Air Army a few kilometers from the town of Koroch in the region of the Kursk Salient. Periodically, aircraft takeoffs and landings were simulated. Enemy aerial reconnaissance took this airfield to be legitimate. For five days (from 15 to 19 June) enemy bombers daily flew strikes against it. The field was ripped apart by shell-holes, and all but one dummy aircraft had been destroyed. As a result, not a single bomb was dropped on the real neighboring airfield. /152

As a result of the three months of heavy battle for air superiority in the spring of 1943 the Nazi Air Force lost approximately 3,700 aircraft and a large number of personnel on the Soviet-German front [172]. Its strength was significantly undermined. The Soviet Air Force during this time had suffered substantially fewer losses, which, in addition, were rapidly compensated for due to the increasing shipments of well-trained flight personnel and new types

of aircraft. Having been hardened and having had their combat experience augmented in past battles, the Soviet fliers had become a true threat for the Nazi invaders.

At the Kursk Bulge

The victories of the Soviet Armed Forces in the winter and spring of 1943 staggered the bloc of fascist nations. The dismal perspective of the losses unleashed by Nazi Germany's war became more and more clear. In spite of the fact that its army had been substantially weakened, the Nazi Command nevertheless resolved to launch an offensive in the summer of 1943 to wreak revenge for the losses suffered in their winter campaign, weaken the political consequences of their military failures on the Soviet-German front, and recapture the strategic initiative.

The Nazi generals worked out a plan for an offensive operation which was given the code-name "Citadel". This operation anticipated simultaneous strikes against the region south of Orel and north of Belgorod to encircle and destroy the Soviet troops in the Kursk Salient.

The enemy concentrated heavy forces for the offensive around Kursk. Aerial support of troops was headed by the Fourth and Sixth German Air Fleets, which counted 2,050 aircraft, which in turn represented 70% of all the aviation operating on the Soviet-German front. The best German air units and commands were gathered here. Modernized Heinkel-111 bombers, two-engined Heinkel-129 assault aircraft, and the new Focke-Wolf-190A fighters were sent to replenish the enemy's air grouping.

The Soviet air grouping at Kursk consisted of the 16th Air Army from the central front and the Second Air Army from the Voroneshchev front. In addition, /153
General Headquarters sent to the Kursk Bulge a 17th Air Army from the southwestern front (commander: General V. A. Sudets) and part of long-range air units. These three air armies and the long-range air units had a total number of 2,900 serviceable aircraft. The overall ratio of the number of aircraft was 1.5:1 in our favor. In addition, units from the Fifth Air Army of the reserve Steppe front could be sent in if necessary to strengthen our Air Force in this region.

Along with guessing at the enemy's intentions, the Soviet Supreme Command decided to first wear down the offensive by the Nazi troops with a deliberately stubborn and active resistance and then destroy the enemy in an all-out counteroffensive.

In preparing for the battle, our aerial observers appeared behind enemy lines day and night. They uncovered concentration points and the enemy's strike groupings, the basis for his aircraft, the nature of his defensive fortifications, his pivots of defense, the locations of his artillery positions and reserves, and his air-defense system. All this aided the Soviet Command in figuring out the enemy's plans and preparing the best defense and subsequent switch to a counteroffensive.

During this time, our long-range aviation continued carrying out its independent mission of destroying the enemy's operational and strategic rail troop movements, so as to slow down regrouping of his troops. With systematic strikes, they not only decreased the volume of movement, but also dealt the enemy heavy losses with respect to both troops and equipment.

Thus, in the raid on the night of 3 May 1943 against the Minsk railroad network, through which trains were passing on their way from Germany and Poland to Kursk, 109 long-range bombers destroyed the goods and passenger stations, the engine shop, and the power station, destroyed three troop echelons, and destroyed a supply dump full of ammunition. Movement along the railway line was held up for three days. In addition, in the city the enemy's air unit headquarters and barracks were destroyed, with the resulting loss of the lives of 200 men in their flight personnel. In all, 2,000 Nazi soldiers and officers were killed in raids against the military objectives at Minsk, in which the First, Second and Fourth Guard Divisions and 36th Long-Range Air Division took part [173].

Our Party and communist youth organizations and the political organs of our air units and commands worked diligently and fruitfully in preparing for the battle of Kursk. All their activity was directed toward perfecting the /154
combat skill of our flight personnel and improving the combat readiness of our air units and divisions. To spread the accumulated combat experience and to make it the property of all our aviators, tactical flight and technical conferences were held. Participants in the battle on the Volga and heroes from the aerial engagements over the Kuban' spoke at these conferences. To the same end, information sheets and brochures were distributed and photographic displays were arranged which gave examples of the experience gained by our best aerial fighters and snipers during assaults and bombing strikes.

Representatives of a Moscow Delegation Hand Over to a Group Aircraft Built with Funds by Workers in the Capital.

On the eve of the battle, many fliers, navigators, engineers, technicians,

and other aviation specialists handed in applications with requests that they be admitted into the ranks of the Communist Party. In just the 283rd Fighter Air Division, were Lieutenant Colonel G. A. Sherokhin was second in command of the political unit, from 1 March to 15 June 1943, 83 men were accepted as candidates and members of the Communist Party of the USSR. Meetings of wing Party bureaus usually were held right at the airfields. It was also there, as a rule, that the division head of the political branch handed out Party cards to those accepted into the Party.

The purposeful day-to-day Party political work strengthened the morale of our fighting aviators. Their hatred of the enemy grew, and their anticipation of the offensive heightened.

The middle of the summer approached, but on the Soviet-German front the lull was still going on. However, on 2 July our Supreme Headquarters forewarned the Headquarters of our central and Voroneshchev fronts of the possible beginning of an enemy offensive on 3-6 July. Our troops were brought to full combat readiness. /155

On 5 July, the pre-dawn quiet was broken by the roar of a thousand guns and the drone of hundreds of airplane engines. This was our artillery, which had opened a hurricane of fire against the Nazi troops which were preparing for the attack, and 417 aircraft from the Second and 17th Air Armies which were heading west to attack the airfields at Mikoyanovka, Sokol'niki, Pomerki, Osnova, Rogan', Barvenkovo and Kramatorskaya.

The operations by the First Assault Air Corps (commander: General V. G. Ryazanov) against the airfields at Sokol'niki and Pomerki were especially successful. The air groups based there lost 39 aircraft and could not participate in the air prepping scheduled for that morning. The enemy suffered substantial losses at the Barvenkovo and Mikoyanovka airfields as well; these had been attacked just at the instant when enemy crews were preparing for takeoff, and a few aircraft had even taxied out to the take-off runway [174]. However, not all the strikes were as effective. Thus, at the Rogan' airfield Soviet fliers failed to destroy a single enemy aircraft.

As a result of this mass strike, approximately 60 German aircraft were taken out of commission [175].

During the artillery counter-prepping and the strikes against the airfields, the Nazi forces were weakened. The element of surprise which the Nazi Command had so much hoped for did not materialize.

At 0530 hours, enemy troops attacked our positions simultaneously on the Orel-Kursk and Belgorodsko-Kursk sectors. The enemy offensive began with the support of his powerful aviation strength. Nazi bombers in groups of 100-150 covered by fighters headed toward our troop positions from different directions. The first to engage them in battle were fliers from the Sixth Fighter Air Corps (commander: General Ye. Ye. Yerlykin) and the First Guard Fighter Air Division of the 16th Air Army (commander: Lieutenant Colonel I. V. Grupenin), as well as the Fourth and Fifth Fighter Air Corps of the Second Air Army (commanders:

Generals I. D. Podgornyy and D. P. Galunov). Intercepting the enemy aircraft at the approaches to their covered objectives, they engaged them in battle, downed them with machine-gun and cannon fire, broke the flight formations of the groups, and hindred on-target bombing. As early as the first half of the day, 79 Nazi aircraft were destroyed.

As the ground battle took on broader and broader dimensions, so did the intensity of the combat in the air increase. Aircraft thronged to the battlefield from all sides. Group after group of heavy Il's flew by under fighter cover. Passing the front line, they fell upon the enemy tanks and guns, throwing hundreds of bombs and rocket missiles at them and covering them with cannon fire. Higher, Pe-2 two-engined bombers rushed by and, in diving runs, threw their bomb loads against the enemy troops. /157

During this day, new PTAB-2.5-1.5 anti-tank bombs, developed by a design group headed by I. A. Larionov, were first used. They burst through the armor of the Nazi Tiger and Panther tanks with an accumulated blast. Using these, fliers from just the 291st Assault Air Division (commander: Colonel A. N. Vitruk) destroyed 30 tanks that day [176].

The battle in the air took on a fierce aspect from its very onset. Repulsing strikes by enemy bombers, our fighter pilots displayed exceptional courage and skill. By the end of the first day, they had downed 260 enemy aircraft [177]. Especially outstanding were First Lieutenant O. S. Belikov, who destroyed four enemy aircraft; Lieutenant S. K. Kolesnichenko, who downed three bombers; and Second Lieutenant V. K. Polyakov, who downed one aircraft with machine-gun and cannon fire, and rammed another. With support from our aviation, our troops successfully repulsed the enemy's attack. By the evening of 5 July, the enemy had only succeeded in wedging into our defense to a depth of 8 kilometers at the few points.

The first day of the defensive engagement showed that under the conditions of stiff resistance on the part of the enemy's air defense, small groups of assault aircraft and bombers could not effectively engage the enemy's antiaircraft artillery and incur serious losses. In addition, to cover them from the air would require a large detail of fighters.

In evaluating this situation, the Commander of the 16th Air Army decided to operate in large groups. Early on the morning of 6 July, our aerial observers first took to the air. They determined in detail the concentration points of enemy tanks, artillery, and motorized infantry, and reported on the deployment of targets. After then, wings from the Sixth Combined Air Corps (commander: General I. D. Antoshkin) took off accompanied by wings from the Second Guard and 299 Assault Air Divisions (commanders: Colonels G. I. Komarov and I. V. Krupskiy) to fly a mass strike against the enemy's grouping at Orel. Approaching the region of combat activity at the same altitude and in dense combat formations, they struck against Nazi troop concentrations. The effect of the raid was striking. Catching site of several burning tanks, our troops, preparing for a counterstrike, launched an attack. During the day of 6 July, the 16th Air Army staged two more mass strikes. These flights were carried out in an organized manner and with fewer losses than on the first day. /158

Swearing of Oaths by Fliers from the First Guard Fighter Air Corps.

No less successful were air strikes in the Belgorodsko-Kursk sector on the same day.

The Nazi General F. Mellenthin, former chief of staff of the 48th Tank Corps which had advanced along the Belgorodsko-Kursk sector, wrote in his post-war memoirs: "...many tanks became sacrifices to Soviet aviation -- during this battle the Russian fliers demonstrated extraordinary bravery in spite of the German Air Force's air superiority "[178].

On the second day of the defensive operation, several correctives were also introduced into the organization of the combat operation of our fighter aviation. The commanders of fighter air commands moved out to command points from which they could control the units under their authority. Pointer patrol zones were extended into enemy territory with the object of intercepting aircraft even before the approaches to the battlefield.

The measures taken immediately resulted in changes in the situation in the air. Encountering steadily increasing resistance, the enemy Air Force suffered heavy losses and cut down his activity by a factor of two. At the same time, our Air Force continued to build up its strikes. Operating in groups of 30 - 150 aircraft, they inflicted serious losses against the advancing Nazi troops. Large groups of aircraft proved more easy to defend -- our losses dropped substantially, while our strike effectiveness increased.

The final shift in the battle for air superiority took place on 7 July. After this day our fighters, having fully seized the initiative, began to reliably cover our ground troops from the air. The majority of enemy bombers were intercepted and destroyed on the approaches to their protected objectives. The activity of the Nazi Air Force decreased with each passing day. Whereas during the first four days of the offensive the Nazis made 1,000-1,700 fly-by's in the Orel-Kursk sector, on 9 July they made a total of only 350 [179].

By 10 July, the enemy's offensive capabilities in the Orel-Kursk sector had been exhausted. Having suffered heavy losses, the Nazis shifted to the defensive once and for all. /159

The battles lasted several more days on the Belgorodsko-Kursk sector. When the enemy's plans to break through to Kursk by the shortest way to the south through Oboyan' were disbanded once and for all, he began to look for vulnerable points in the defense in other sectors, and he concentrated his strongest forces around Prokhorovka. In attempting to frsutrate the enemy's intention, the command of the Voronezh front on 12 July decided to wage a counter-strike. On the eve of this counterstrike, long-range aviation units and night bombers from the air armies continuously operated against the enemy's troops on the battlefield as well as striking against his railroad stations, ferries, and columns along the highways for two nights. Aerial prepping began an hour before the counterstrike. Fliers from the First Bomber (commander: Colonel I. S. Polbin) and First Assault Air Corps and the 291 Assault Air Division flew several well-aimed strikes against enemy tank concentrations and artillery at fire positions. Thousands of bombs were dropped on the enemy's Second Tank Corps, which had been heavily weakened as the result of intensive air operations.

The battle in the region of Prokhogovka grew into a massive meeting engagement. Both sides send in large numbers of troops and artillery, approximately 1,500 tanks and self-propelled guns. During this time, stubborn air battles were taking place which lasted the entire day. Assault aircraft and bombers from the Second Air Army were constantly suspended over the battlefield supporting the tankers. In the day of battle, the enemy lost more than 350 tanks and over 10,000 soldiers and officers [180]. The depleted armored avalanche was stopped and then thrown back. The courage and bravery of our infantry men, fliers, and tankers had won. Through the efforts of our ground troops and aviation, the enemy's last attempts to break through to Kursk were forestalled. By 23 July, the troops of the Voronezh front had resumed the position they had occupied prior to 5 July. The defensive period of the great battle had ended.

In the defense at Kursk, our aviation flew more than 28,000 missions and was a great aid to ground troops in repulsing the enemy's offensive. On the average, there were 1,500 missions per day, 45% of which were aimed at destroying enemy troops and equipment.

During the offensive operation, the battle for air superiority was distinguished by a heretofore unparalleled scope and sweep in achieving set objectives. In the areas of the main strikes, there were more than 4,000 aircraft operating from both sides. The enemy's aviation grouping suffered heavy losses at Kursk. In aerial battles and at the airfields, they lost 1,500 aircraft, i.e., three quarters of their initial force [181]. /160

A. K. Gorovets

In repulsing the enemy offensive in the region of the Kursk Bulge, in addition to our front-line aviation, many long-range units were used, as the result of whose operations 2,360 tons of bombs were dropped against the enemy. Their strikes were flown against enemy troops both in the battlefield, at river crossings over the Severnyy Donets, the airfield at Orel and Karachev, the railroad links at Gomel', Unecha and Roslavl', as well as supply stations for the enemy's Orel and Belgorod-Khar'kov groupings.

In the defensive battles, our fliers showed high combat skill, bravery and heroism. During those days, the name of the communist and Guard flier First Lieutenant A. K. Gorovets was immortalized forever through his heroic feats. In one battle he downed nine enemy bombers. In returning to his airfield, Gorovets was attacked by four Nazi fighters and was killed in an unequal aerial battle. This brave fighter pilot was posthumously awarded the Rank of the Soviet Union. Other to distinguish themselves in the encounters at the Kursk Bulge were

Captain S. D. Luganskiy, Major M. S. Tokarev, Lieutenant V. I. Andrianov, and many other heroic fliers. This was where Ivan Kozhedub began his combat glory.

Having brought the defensive operation to a successful close, the Soviet troops began preparing intensively for the counteroffensive. In the direction of the Orel, the First, 15th and 16th Air Armies were assigned to support the troops of the western, Bryansk, and Central fronts, while on the Belgorod-Khar'kov sector the Second and Fifth Air Armies would be operating in the interests of the Voronezh and Steppe fronts. All the air armies had 5,000 aircraft. The Nazi German air grouping numbered 2,200 aircraft after replenishing with new squadrons [182]. /161

The offensive in the Orel sector began on 12 July. Throughout the preceding night, long-range bombers from the First, Second and Third Guard Air Corps, and the Fifth and Seventh Air Corps and the 45th Air Division (commanders: Generals D. P. Yukhanov, Ye. F. Loginov, N. A. Volkov, I. V. Georgiyev, and V. Ye. Nestertsev, and Colonel V. I. Lebedev, respectively), as well as the 213th and 284th Night Bomber Air Division and the First and 15th Air Armies (division commanders: General V. S. Molokov and Major G. P. Pokoyevoy) bombed artillery positions and strong points in front of the anticipated sector of breakthrough in the defense. The flights by our night bombers were highly effective. Dropping 710 tons of bombs, our bombers disrupted the enemy's command over his troops and put large numbers of guns, tanks, and defensive fortifications out of commission [183].

Fifteen minutes before the attack, hundreds of day bombers and assault aircraft flew missions against these same objectives. The Second Bomber and Second and Third Assault Air Corps (commanders: Generals V. A. Ushakov, V. V. Stepichev, and M. I. Gorlachenko), as well as the 224th and 233rd Assault and 113th Bomber Air Divisions, which were commanded by Colonels M. V. Kotel'nikov, V. V. Smirnov and General F. G. Michugin, took part in the direct air prepping.

Under cover of smoke screens laid by our assault aircraft, strike groupings on the western and Bryansk fronts went into the attack and stormed toward the breach in the enemy's defenses. There was continuous air support of ground troops from the onset of the defensive.

An hour after the attack was launched, enemy bombers began to appear over the battlefield. Their activity steadily increased. The Nazi Command had decided to break off our offensive through the strength of its aviation. However, fliers from the First Guard and Eighth Fighter Air Corps (commanders: Generals Ye. M. Beletskiy and F. F. Zherebchenko) were on the alert and met the enemy fully armed. In combined attacks, they downed enemy aircraft, broke up their flight formations, and gave them no chance to drop their bombs on target over our enemy troops. During the first day of the counteroffensive, 72 aerial battles were fought in which the enemy lost 86 aircraft [184]. In these battles, especially distinguished were fighter pilots A. P. Mares'yev, /162
P. I. Murav'yev and I. P. Vitkovskiy, who were subsequently awarded the Rank of Hero of the Soviet Union. Inspired by the air support, our troops smashed the enemy's resistance and by 19 July had pushed 20-70 km into his ranks. During the first three days of counteroffensive, fliers from the 15th Air Army downed 247 enemy aircraft in 153 battles [185].

A. P. Mares'yev

The counteroffensive on the central front began on 15 July. In three days, troops there had regained positions they occupied prior to 5 July, and by 6 August they had taken possession of Kromam'. The 16th Air Army, which was supporting them, flew 1,000 or more missions daily, dealing the enemy heavy losses.

French fliers from the "Normandie" escadrille fought wing to wing with Soviet aviators in those days. The French volunteers, who had reached the front late in March and had been taken into the First Air Army (commander, General M. M. Gromov), demonstrated great skill and bravery in their very first encounters with the enemy. For the exemplary manner in which they fulfilled their combat missions, and for the courage and bravery shown at that time, on 2 July 1943 a decree by the Presidium of the Supreme Soviet of the USSR awarded Soviet Orders to the first five French volunteers (J. Toulain, A. Litolffe, A. Durand, M. Lefevre, and L. Duprat).

In August of 1943, after the arrival of replacements, the French escadrille was reorganized into a wing, with Major P. Puillad appointed commander; later, Major L. Delfino commanded the wing. The French fliers took part in battles in Smolenshchina, White Russia, Lithuania, and East Prussia. In October of 1944, for their successful combat operations in supporting and covering troops during the forcing of the Niemen River, the wing received the honorary name "Nemanskiy" and became known as the "Normandie-Niemen" First Special French Fighter Air Wing. These pilots flew over 5,000 combat missions during the time that they were on the Soviet-German front. They downed 268 enemy aircraft and damaged 80 during aerial combat. Of the 106 French fliers who fought within the ranks of the Soviet Air Force, 96 were awarded Soviet Orders, while four -- M. Albe [illegible], R. de la Poipe, M. Lefevre and J. André -- were awarded the Rank of Hero of the Soviet Union. For successfully carrying out its combat missions, the wing was seven times noted in Orders of the Soviet Supreme Command and presented with the Soviet Orders The Red Banner and the Order of Aleksandr Nevskiy, the French Legion d'Honneur, the military cross "Za osvobozhdeniye" (For Liberation), and military medals. /163

The advance by Soviet troops toward Orel went successfully. All enemy attempts to delay our advance by raids with his bombers were useless. Fliers from the 315th Fighter Air Division (commander: Colonel V. Ya. Litvinov) covered our advancing troops reliably, even under the most difficult weather conditions. The pilots of the 225th Assault Air Division (commander: Colonel A. F. Obukhov) performed bravely on the battlefield. The commander of the Third Guard Tank Army, General P. S. Rybalko, wrote at that time that the assault pilots and bombers aided our tankmen in breaking through the enemy's defenses, while our fighters dependably covered the army's combat formations from the air [186].

After 1 August, General Headquarters strengthened the 15th Air Army with new air units: the Second Fighter and the 11th Combined Air Corps (commanders: Generals A. S. Blagoveshchenskiy and S. P. Danilov), which were immediately engaged in combat. With the active support of our aviation, the troops along the Bryansk front overcame all defensive zones and began to envelop an enemy grouping in the region of Orel. The impending threat of encirclement forced the enemy to retreat hastily.

Enemy columns began to pull to the west of O l starting with the morning of 1 August. To disrupt their organized retreat, the 15th and 16th Air Armies sent a substantial portion of their forces to operate against the retreating troops, their river crossings, and railroad echelons. Assault aircraft and bombers in many cases operated from low altitude and even hedge-hopped, attacking targets in several passes. The roads along which the Nazis were retreating were strewn with bodies and jammed with smashed trucks, tanks, guns and other combat equipment. During August, fliers from the 15th Air Army alone flew 16,529 missions and destroyed 2,500 trucks and 170 tanks, smashed 175 railroad cars, blew up 18 warehouses with ammunition, and set fire to 40 enemy aircraft on the ground [187]. /164

At dawn on 4 August, the armies along the Bryansk front were engaged in house-to-house fighting in Orel, and by the morning of the next day the city had been completely cleaned of Nazi occupation. On the same day, troops along the Stepnoy front liberated the ancient Russian town of Belgorod. In honor of this victory Moscow, the capitol of our country, for the first time in World War II saluted the valorous troops of the Bryansk, Western, Central, Stepnoy, and Voronezh fronts with 12 artillery salvoes from 224 guns.

The troops of the Voronezhskogo and Stepnoy fronts launched a counter-offensive toward the Belgorod-Kharov sector on 3 August. Here, as had been the case at Orel, heavy air prepping was carried out on the night before the offensive and immediately before the attack. Fliers from the First Bomber and Fifth Assault Air Corps, as well as those from the 202nd Bomber and 208th Night Bomber Divisions (commanded by Colonels S. I. Nechiporenko and L. N. Yuzelev) destroyed many field fortifications and damaged the fire-power of enemy strong points. They operated equally successfully later in support of advancing troops.

On the first day of the counteroffensive, the Air Force flew 2,600 missions along the two fronts. The degree of effectiveness of these operations can be judged from the testimonial of the ground-troop command. "It was only through the ingeniously organized coordination and massed strik s by Il-2 pilots," -- General Z. Z. Rogoznyy, commander of the 48th Infantry Corps, wrote at that time, -- "that ground units could made any headway "[188].

Overcoming the enemy's main defensive resistance, Soviet troops pushed forward to the south and southwest. Reaching the outer Khar'kov defensive line, they cut the Khar'kov-Poltava railroad line. /165

Trying to avoid complete rout, the Nazi Command rapidly shifted tanks and motorized divisions from the Donbass and other sectors to the region of

Borodukhov and Akhtyrka to launch a counterthrust against the flank of our troops on the Voronezh front. Our aerial reconnaissance noted large movements behind the enemy's lines in good time. Decisive countersteps were taken immediately. Our front-line aviation and units of our long-range bombers were thrown against the enemy troops moving along the railroad and highways.

The Eighth Air Army from the southern front was the first to be sent into this action. Its pilots, flying 400-500 missions per day, constantly struck against the enemy's tank and motorized columns moving toward Khar'kov. Depending on the degree to which the enemy troops moved along the front line into battle, units from the 17th, Fifth, and Second Air Armies moved against them and destroyed echelons at the railroad stations of Gorlovka, Slavyansk, Barvenkovo, and Pavlograd and motorized columns along the roads. At the same time, strikes were flown by pilots from the Fourth Guard and Sixth Long-Range Air Corps against the railroad junctions and stations at Poltava, Lyubotin, Krasnoarmeyskoye, Krasnograd, Merefa and others, where aerial reconnaissance had uncovered enemy echelon and troop concentrations. As a result of the combined operations of front-line and long-range aviation, the troop movement was slowed down, and great losses were inflicted.

In preparing for the counteroffensive, the enemy increased the activity of his Air Force. His bombers began to appear more frequently over the front-line troops. Each time, however, they encountered heavy resistance from our fighters. The combat skill of the Soviet fliers was every time matched by their bravery and heroism. Fighter pilot Second Lieutenant A. V. Dobrodetskiy was an example of courage, boldness, and mutual assistance in battle. In covering ground troops, he and his commander attacked a large group of enemy aircraft. There ensued a fierce battle in which the brave flier struck down one Nazi and repulsed several attacks against the leader's aircraft. At that end of this extended battle, Dobrodetskiy noticed that a Messerschmidt was sneaking up on his commander's aircraft. At first he attempted to cut off the enemy with machine-gun and cannon fire, but he expended all his ammunition. Then the Soviet flier used the weapon of the bravest -- the ram. The enemy fighter was destroyed. Dobrodetskiy, a product of training by the Leninist communist youth, perished but saved the life of his commander. By decree of /166
the Presidium of the Supreme Soviet of the USSR dated 4 February 1944, A. V. Dobrodetskiy was posthumously awarded the Rank of Hero of the Soviet Union. By order of the Ministry of Defense, his name was eternally entered into the lists of the N-th Guard Fighter Air Wing.

Being incapable of fully concentrating their forces, the Nazi Command nevertheless attempted counterstrikes: on 11 August south of Bogodukhov, and on 18 August in the region of Akht'yrki. For 10 days fierce battles continued. Through the combined efforts of our ground troops and aviation, the enemy's intentions of stalling our offensive were destroyed.

At the same time, troops along the Voronezh front repulsed enemy counterstrikes, and troops along the Stepnoy fought for Khar'kov with the support of the Fifth Air Army. By 18 August, they had surrounded it on three sides, and on the night of the 23rd they completely drove out the invaders from this vital industrial center of the Ukraine.

The liberation of Khar'kov ended the counteroffensive on the Belgorod-Khar'kov sector.

The great battle at Kursk ended in glorious victory for the Soviet Armed Forces over the Nazi German Army. The results of this battle was the upsetting of the enemy's most powerful and combat-ready grouping, and the liberation of many large towns and millions of Soviet citizens who had fallen under Nazi captivity.

During the battle for Kursk, the Soviet Air Force flew approximately 118,000 missions [189]. During the defensive operation and the counteroffensive, they flew an average of more than 3,000 missions daily, dropping 500 tons of bombs on the enemy objectives each time. During aerial encounters and on the airfields, Soviet fliers destroyed more than 3,700 enemy aircraft from 5 July to 23 August [190]. Having routed the enemy's most combat-ready air grouping, the Soviet Air Force achieved strategic air superiority, which it maintained from then on until the end of the war.

In the counteroffensive at Kursk, the aerial offensive was used in full force in practice for the first time during World War II. Coordination with the tank armies was organized here on a larger scale than every before. The experience gained by maintaining constant support for advancing troops, especially tank formations, was broadly used in subsequent offensive operations during World War II.

Over the Dnepr

/167

The successfully completed counteroffensive at Kursk created favorable conditions for a general offensive by the Red Army on the southern wing of the Soviet-German front. Starting on 13 August, heavy fighting broke out in the area of the Donets. The advancing troops along the southwest front began to pound opposing enemy groupings, attempting to cut off their means of retreating to the Dnepr. In five days, active combat operations broke out along the sector occupied by troops of the southern front as well.

Early in the operation, the 17th Air Army of the southwest front concentrated its forces in the support of ground troops operating around Zmiyev and the Izyum-Barvenkovo sectors.

By the end of August, front-line ground units in coordination with the Air Force had forced across the Severnyy Donets and occupied several strong points on its right bank. In the preparatory period prior to the beginning of the operation in August, the 17th Air Army flew more than 16,000 missions [191].

These operations were highly regarded by the combined-arms command. The commander of the Eighth Guard Army, General V. I. Chuykov, commended the operations by our assault fliers in this way: "Our assault fliers operated quite well, demonstrating bravery and heroism in carrying out their combat missions. Their work inspired our troops and facilitated our forward movement" [192].

The southern front, where the Eighth Air Army was operating, had in the meantime pushed toward a breach in the Mius defensive line, which the Nazis had strengthened for two years. The battle for each meter of ground was fought with incredible keenness. Assault pilots flew four to five combat missions per day. They encountered dense barrage fire by enemy antiaircraft batteries, and the Messerschmidts pounced upon them with fury. But our Il's, overcoming all difficulties, continued toward their objectives. They worked to aid our ground troops in breaking through the enemy's defense.

Quite frequently our fliers would make raids against enemy airfields. During one such mission, Second Lieutenant Lavr Pavlov, a pilot in the 76th Guard Assault Air Wing performed a heroic feat. Following behind the supporting aircraft in a pair led by First Lieutenant M. T. Stepanishchev, Pavlov was the first to notice that the ribbon of a tracer shell was streaking toward the commander's craft. He immediately dived toward the aircraft battery and, with a long burst of cannon caught fire, silenced it. At that point the group commander's alarmed voice broke out over the radio: "I've been damaged, my engine is out, I'm going to land." /168 And the lead assault aircraft touched down five kilometers from the airfield where aircraft they had set afire were blazing. Pavlov, in turn, landed right along with the downed Il on enemy territory. The Nazis were attempting to reach the point of the forced landing, but the remaining four assault aircraft held them up. Lieutenant Stepanishchev and his aerial gunner quickly rushed over to the cockpit of Pavlov's aircraft, and they took off. The Nazis sent their fighters in pursuit, but the attacks by Messerschmidts were successfully repulsed.

By 30 August, troops along the southern front had pushed 50 kilometers forward and, having liberated Taganrog, created a breach in the enemy's defense at Mius. Attempting to prevent further success, the Nazi Command increased the operation of its air grouping there to 750 aircraft, while at that time the Eighth Air Army had 924 aircraft [193].

In spite of growing resistance on the part of enemy fighters, the Eighth Air Army maintained its air supremacy and continued actively supporting ground troops. In a month its fliers fought 285 aerial battles and downed 280 Nazi aircraft, 34 of which fell to the share of assault aircraft.[194] During the August battles, especially outstanding groups were the 270th Bomber, Ninth Guard, and 236th Fighter Air Divisions, commanded by Colonels G. A. Chuchev, I. M. Dzusov, and V. Ya. Kudryashov, respectively.

The Nazi Command was forced to pull its troops back to the Dnepr. In order to break up the organization of the Nazi retreat, the 17th Air Army flew day and night strikes against the retreating troops and bombed their railroad and highway communications.

Especially successful were the crews of the Ninth Combined Air Corps under the command of General O. V. Tolstikov. On 25 August, 18 Il-2 aircraft headed by Captain M. A. Inyrev flew a raid against the station at Barvenkovo, where the Nazis had shipped 50 echelons of ammunition, and 20 echelons of supplies and equipment. As our assault bombers flew away from the target, the echelons with ammunition, supplies and equipment were burning, and the shells

and bombs which were located there were exploding for more than two days.[195] Not a single train could get through the station for several days afterward.

With active air support, by late September the troops along the southwestern front had reached the Dnepr almost along the entire path of the offensive, and several beachheads had been established on its right bank. Troops on the southern front went on to the banks of the river Molochnaya, and liberated Donetsk, Mariupol', Osipenko and several other cities from the invaders. /169

Almost simultaneously with the operations in the Donbass, the Red Army unleashed a broad offensive along the middle courses of the Dnepr. Having broken through the defenses, troops of the central, Stepnoy and Voronezh fronts pushed west and liberated Bakhmach, Poltava, Kremenchug, and many other cities. On 21-25 September they reached the Dnepr, forced it at a rush, and established several beachheads.

In the growing battle for the Dnepr, enemy resistance was steadily increasing both on the ground and in the air. During the first days of forcing the river, our bombers and assault aircraft operated along a limited radius and with restricted forces, because there were insufficient airfields for shifting our aircraft. The fighter air wings which had been moved to the forward landing area began active combat with Nazi bombers.

The battles by ground troops in crossing the Dnepr were greatly aided by the operations of our fighter pilots. Letters and congratulatory notes full of thanks were received in those days from ground troop headquarters, officers, and soldiers. Here, for example, is a letter from one of the participants in the battle for the Dnepr, Private Chernomorenko: "It was during the Dnepr crossing. Our raft had just moved away from the bank when Nazi bombers appeared. They hadn't yet even had the chance to deploy when our fighters appeared glinting in the sun. And when a Nazi bomber fell into the Dnepr attempting to flee, we cheered. Thanks, fighters!"[196]

In covering our ground troops and escorting our bombers and assault aircraft during their missions, our fighter pilots displayed great skill and heroism. Frequently they would emerge victorious from battles with numerically superior enemy forces. An example of the courage shown in those days is that of Hero of the Soviet Union Colonel N. I. Varchuk, commander of the 737th Fighter Air Wing. While covering assault aircraft, he encountered 40 Ju-87 bombers covered by 15 fighters in the area of his target. Ordering his second in command to follow with a group of assault aircraft, the brave commander accompanied by a support aircraft attacked the Junkers heading toward our troops with their bomb loads. Downing one bomber with a sniping blast, he scattered the others and then went into battle with the fighters. The battle was brief, but the Nazis lost two Messerschmidts which Varchuk had downed in head-on attacks.

As a result of the September offensive, troops along the central, Voronezh and Stepnoy fronts, with the active coordination of our Air Force, had pushed westward up to 300 kilometers and along the 600-kilometer from Loyev to /170

Dnepropetrovsk they had reached the Dnepr and established 21 beachheads on its right bank. Almost the entire section of the Ukraine on the left bank of the river had been liberated.

In October, the battles for the Dnepr became even more fierce. The enemy constantly counterattacked our forces, trying at any price to drive them from their beachheads. These counterattacks were supported by large numbers of bombers. The battle for air superiority became substantially sharper.

Frequently, assault aircraft and even bombers would enter battle along with the fighters. Thus, on 20 October, while returning from their target, a group of 17 Pe-2 dive bombers under Colonel I. S. Polbin, commander of the First Bomber Air Corps, encountered 18 Ju-87 enemy bombers heading toward Pyatikhatka, where our troops were positioned. Ordering his covering fighters to engage the Messerschmidts in battle, Polbin bravely threw his group into an attack against the Junkers. Not having anticipated such a daring offensive, the Nazis were taken by surprise and turned west, dropping their bombs on their own troops. In pursuit, our group reached the enemy airfield at Berezovka, from which the bombers had taken off. Then Polbin along with his support aircraft decided to attack them. The enemy aircraft taking off ran into withering fire from our fliers. Two Junkers broke apart in the air and fell burning on the outskirts of their airfield. Both aerial battles lasted a total of only several minutes, but the Nazis lost 13 aircraft in them, two of which were downed by Guard Colonel I. S. Polbin. On our side, we suffered the loss of only one Pe-2 bomber [197].

Stubborn enemy resistance did not decrease the spirit for the offensive which the Soviet troops felt. With active air support, they expanded the beachheads they occupied and liberated the towns of Zaporozh'ye, Melntopol', Dnepropetrovsk, and Dneprodzerzhinsk, and drove the invaders out of Severnaya Tavriya, blockading them in the Crimea on the ground. The Soviet Air Force made substantial contributions to all these victories. The Air Force along the five fronts in October alone flew 50,000 missions and hit enemy objectives with 6,000 tons of incendiary and fragmentation bombs, almost 30,000 rocket missiles, and 183,000 anti-tank bombs. The enemy Air Force suffered heavy losses. In aerial encounters and on the airfields, they lost 1,325 aircraft during this time [198].

Our long-range Air Force, which had flown strikes against the major railroad centers at Konotop, Bakhmach, Nezhin, Krasnograd and other towns, took an active part in the liberation of the areas of the Ukraine on the left bank. When our troops the Dnepr and occupied beachheads, they destroyed enemy defensive implacements, reserves, and supply dumps, and operated against his airfields. The Second Guard Air Corps alone during these operations flew approximately 800 missions and dropped more than 1,000 tons of bombs on enemy objectives [199]. /171

The decisive period during the summer and autumn campaign of 1943 was characterized by fierce battles for further extending our beachheads on the right bank of the Dnepr and liberating the capitol of the Ukraine, Kiev.

The offensive by troops of the First Ukrainian front from the beachhead at Lyutezh (to the north of Kiev) was undertaken in early November after careful secret regrouping. The ratio of air strengths toward the beginning of the Kiev operation was approximately equal. Whereas the Second Air Army had 603 aircraft, the enemy had approximately 610 [200].

The attack on the forward edge of the enemy defense took place early on the morning of 1 November after artillery and air prepping. For an hour and a half, assault aircraft and bombers in groups of 30-40 pounded enemy troops and fire points in the region of Pushcha Voditsa, Goryanka, and Priorka. Under heavy strikes by our troops and aviation, who during this first two days flew 640 missions [201], the enemy began to retreat on the southern and southwestern sectors.

The Nazi German Command threw all its available Air Force strength, including a recently arrived group of aces, against the Lyutezh beachhead. But the Soviet fliers, inspired by their significant successes, performed bravely and confidently, destroying enemy bomber attempts to break up the operation of our crossings over the Dnepr or to hinder our offensive.

Our mobile units, which had been thrown into the breach, achieved great success. By morning they had pushed to the region of Svyatoshino and had seized the Kiev-Zhitomir Highway. On 6 November 1943 Soviet troops liberated Kiev, capitol of the Ukraine, and in succeeding days, many Ukrainian towns on the right bank of the river.

All air units participating in the battle for Kiev received the thanks of the Supreme Command, and the Fourth Guard, 264th and 291st Assault, Eighth Guard and 256th Fighter and 208th Night Bomber Divisions became designated the Kiev Divisions. /172

The liberation of Kiev created favorable conditions for unleashing offensive operations with the objective of destroying the enemy on the right-bank territories of the Ukraine. Taking this into account, the Nazi Command on 13 November ordered a counteroffensive in the region of Zhitomir. To neutralize our Air Force, enemy air squadrons flew massive strikes against our airfields.

An especially powerful mission was flown against the forward airfield in the region of Vasil'kov, where our 291st Assault Air Division had been shifted. However, our aircraft there had been dispersed and camouflaged, and dummies had been set up on the runways. The Nazi bombers dropped 2,000 bombs. The flying field was thoroughly broken up with craters, and almost all the dummies had been burned, but only one of our real aircraft had been damaged. The measures taken by the Command in camouflaging this and other airfields had essentially nullified the enemy Air Force's attempts. Out of 25 of their strikes, 19 were flown against dummy airfields. Our losses during this time totalled only three aircraft.

Having repulsed the enemy's counteroffensive, the troops of the First Ukrainian front on 25 December wound up the Kiev offensive operation. During

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it, our Air Force had flown over 20,000 missions in two and a half months of intense combat operation. The enemy had lost 309 aircraft in aerial combat [202].

Thus, in the fierce battle the Soviet Armed Forces, having seized the strategic initiative, had from November 1942 to December 1943 fought its way west 500 to 1,300 kilometers and liberated two thirds of Soviet territory which had been occupied by the invaders. A radical shift had taken place both with respect to the war in the Soviet Union and World War II in general.

During the second period of the war, Soviet aircraft flew over 885,000 missions [203]. Coordinating its operations closely with ground troops and the Navy, our Air Force during this time had annihilated a significant percentage of the personnel and equipment of the Nazi army.

An important result of the combat operations by the Soviet Air Force was their seizing strategic air superiority, as one of the basic conditions necessary for successfully carrying out broad offensive operations. The fight for air superiority in 1943 was carried on even more actively and drastically than earlier. During it, aerial operations took place with heavy forces of front-line and long-range aviation. /173

The Communist Party and the Soviet government were highly impressed by the victory achieved by the Soviet Air Force. Many units and commands were awarded the Rank of Guard and were given honorary designations. Our Air Guard included 148 air wings, divisions and corps. The first of the air corps to be transformed into guard corps were the First Fighter (commander: General Ye. M. Beletskiy), the Second Bomber (commander: General V. A. Ushakov), the First Combined (commander: General V. I. Aladinskiy), and the First Assault (commander: General V. G. Ryzanov) corps. One hundred forty-two air units and commands received the honorary names of the cities whose liberation they had taken part in. Thousands of combat aviators were given government awards.

During the Winter Offensive

The Soviet Air Force entered the third and conclusive period of World War II even more powerful and strengthened. Our aircraft industry had turned out 35,000 combat aircraft in 1943 [204]. This not only permitted us to replenish our losses of aircraft on the front, but also to form many new air units and commands. In addition, our air divisions started the conversion from two-to-three -- four-wing composition, and 50 assault and 35 fighter air wings were shifted to 40-aircraft composition by the beginning of the third period in the war [205].

Despite heavy losses, the enemy Air Force still represented a serious power which could not be underestimated. Nazi Germany's Air Force and both of the satellites numbered approximately 3,000 aircraft on the Soviet-German front.

In the winter offensive of 1943/1944, the Red Army had destroyed large enemy groupings at Leningrad and Novgorod, on the right banks of the Ukraine

and in the Crimea, and had liberated a substantial percentage of Soviet territory from the Nazis.

The first to begin the offensive were the troops of the Leningrad and Volkhov fronts. They were supported from the air by the 13th and 14th Air Armies (commanders: Generals S. D. Rybal'chenko and I. P. Zhuravlev), and part of the forces from our long-range aviation and Red-Banner Baltic Fleet Air Force. In addition, the Second Guard Fighter Air Defense Corps was used in covering Leningrad. A total of 1,240 aircraft participated in the operation [206]. /174

On the night before the offensive, our long-range bombers flew heavy assaults against enemy artillery which was shelling Leningrad, and against their defensive fortifications, tanks, and troops along the first line of defense. Due to inclement weather, which restricted air action, our ground troops launched the attack without the necessary air support. Encountering stubborn enemy resistance, they switched to the defense at a depth of 8-10 km.

P. A. Pokryshev with the Valiant Defenders of Leningrad Being Awarded High Government Honors.

After 15 January 1944 the weather improved and combat activity by the Soviet Air Force took on a broad scale. Groups of assault aircraft could be seen almost constantly in front of our combat formations of advancing infantry and tanks, destroying and neutralizing enemy fire points. They would literally hang over their targets for 20-25 minutes and make 5-6 runs with each attack. In those days the enemy was pounded by the great skill and bravery of groups of assault aircraft flown by such as P. M. Golodnyak, A. I. Kizima and G. M. Parshin. Subsequently, P. M. Golodnyak and A. I. Kizima were awarded the Rank of Hero of the Soviet Union, and G. M. Parshin was awarded the Rank for the second time. /175

On 19 January, Moscow, our capital, saluted the troops of the Leningrad front who had taken possession of Krashnoye Selo and Ropsha. In honor of their having gained this victory, many commands and units, including the Ninth Assault Air Division, the 101st Long-Range Air Wing, and the 214th Guard Transport Air Wing, were given the names Krasnosel'skiy and Ropshinskiy.

After 21 January, the offensive spread out over a broad front from the Gulf of Finland to Lake Il'men'. In spite of low cloud-cover and limited visibility, our fliers continued their operations, flying strikes against the enemy's retreating troops in small groups of assault aircraft. At the same time, the front-line and long-range bombers were carrying on battle with the reserves. On the night of 26 January, 22[illegible] long-range bombers attacked the railroad stations at Siverskaya and Volosovo. The Soviet fliers dropped 243 tons of bombs, inflicting heavy damages against the enemy and putting the railroad stations out of commission. The shipment of troops along the railroad from Narva and Luga ceased.

By early February, the Nazi Command had begun shifting reserves from Pskov to the front in order to bring our offensive to a halt with a counter-strike. The troop movement behind the enemy line was observed in good time by our aerial observers. The enemy columns moving to the northwest were subjected to crushing strikes by fliers from the 13th Air Army. On the roads leading from Pskov to the east and northeast, from six to 11 February they destroyed approximately 200 troop-carrying trucks, 250 vehicles with supplies, 20 guns, two infantry battalions and 134 railroad cars [207]. The German troops preparing for the counterstrike had been weakened.

During the offensive operation, the battle against the enemy in the air did not cease. To maintain air superiority, our front-line aviation operated actively against the enemy airfields. On 26 February, assault aircraft and bombers from the 13th Air Army flew a raid against the airfield at Tartu, and knocked out 21 of 46 enemy aircraft based there. In addition, six enemy fighters were downed in an aerial encounter. Our side suffered no losses [208]. On the same day, 19 assault aircraft and 36 fighters from the Ninth Assault Air Division from the Red-Banner Baltic Fleet attacked the airfield at Rakvere, destroying nine Nazi aircraft.

In addition to coordinating its efforts with the advancing troops, our long-range aviation also flew missions against enemy military and industrial objectives and ports. In February they repeatedly bombed troop concentrations in the ports of Kotka and Turku, as well as military and industrial objectives at Helsinki. These raids, in which 400-900 bombers would participate, hastened Finland's withdraw from the war. /176

At the same time, our long-range aviation destroyed enemy railway troop movement. On the night of 19 February 1944, 380 long-range bombers flew a strike against the Pskov railroad center, dropping approximately 4,000 bombs with a total weight of 547 tons [209]. As the result of the raid, many fires broke out. Echelons, warehouses, and station buildings caught fire, and fuel dumps exploded [210].

The offensive outside Leningrad and Novogorod ended in late February 1944. Having destroyed the so-called "Northern Wall", Soviet troops pushed the enemy 220-250 kilometers to the west and reached the outskirts of Soviet Estonia. During this operation and subsequently, until the end of March, the 13th and 14th Air Armies flew approximately 20,000 missions [211]. Our aviation, maintaining air superiority, constantly supported our advancing troops. The front-line and long-range fliers offered substantial aid to the partisans in the Leningrad Oblast, delivering 278 tons of needed equipment to them.

The Supreme Command and the Soviet government paid high tribute to the services and heroism of the flight personnel in the Soviet Air Force. Hundreds of aviators who had defended our "Hero" cities and hammered the enemy during the offensive were awarded military honors. Most outstanding, such as V. I. Vedeneyev, V. A. Goncharuk, D. V. Yermakov, P. A. Pilyutov, N. I. Svitenko, V. G. Serov, V. Ye. Shalimov, M. F. Sharonov, N. G. Shcherbina and others, were awarded the Rank of Hero of the Soviet Union. For their successful combat activities, air units and commands received such names as Gatchinskiy, Novgorodskiy, Krasno-gvardeyskiy, and Pushkinskiy.

At the same time as the operations outside Leningrad and Novgorod, active combat operations were breaking loose on the right-bank Ukrainian territory. On 24 December 1943, the offensive of the First Ukrainian front resumed. The aviation taking part aided the infantry and tank units to break through the enemy defense, after which they crushed retreating enemy troops and flew strikes against his railroad objectives.

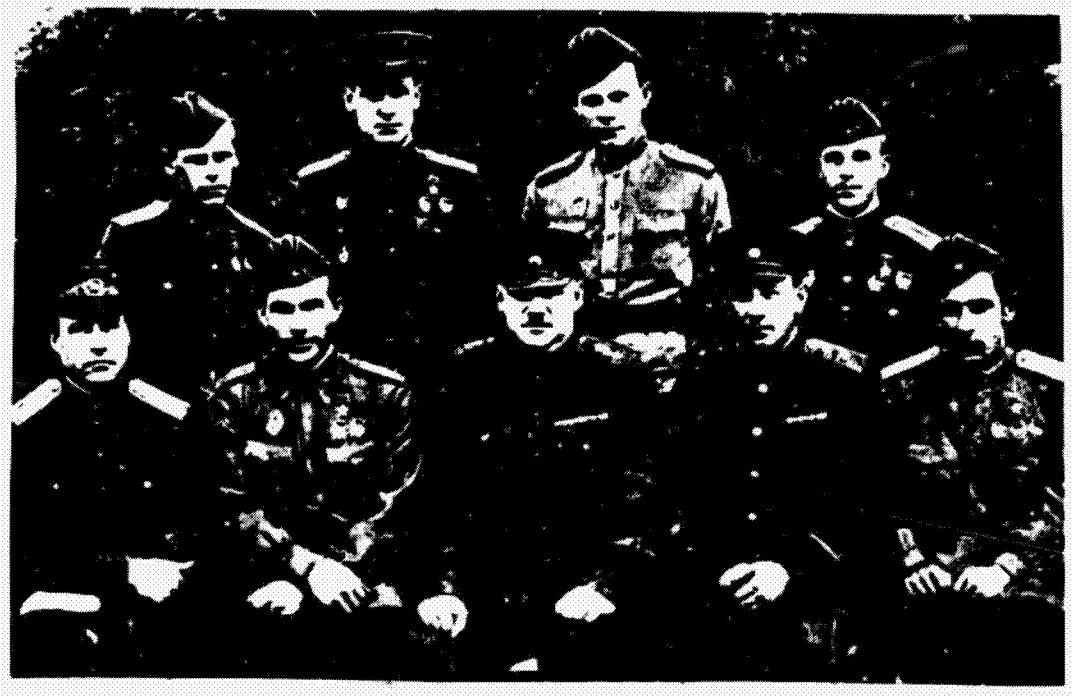
The most successful was the raid of 7 January 1944 against the Shepetovka railroad center, which was being used by the Nazi Command to maneuver troops and to supply front-line units. Especially many military echelons were being unmassed here at that time. Seven of our best fliers from the 525th Assault Air Wing headed by First Lieutenant I. M. Dolgov were appointed to make the strike against the Shepetovka railway center. Surviving the heavy opposition by antiaircraft batteries, the assault pilots broke through to their target and attacked it with bombs, rocket missiles, and machine-gun and cannon fire. Their strike proved to be precise and highly effective: several echelons with fuel, ammunition, tanks and infantry were destroyed, and operations along that railroad center were curtailed for a long time. For their successful raid against Shepetovka, First Lieutenant I. M. Dolgov was awarded the Order of Alexander Nevskiy, Major N. V. Sharonov was awarded the first medal of the Order of the Patriotic War, and Second Lieutenants L. A. Breskalenko, A. S. Kosolapov, G. F. Pastukhov and N. I. Rodin and Lieutenant I. V. Ukhabov were awarded the Order of the Red Banner. /177

In January, Soviet troops launched an offensive along the entire southern sector of the Soviet-German front. On 25 January, the armies of the First and Second Ukrainian fronts began active combat operation with the object of encircling the enemy, who was tenaciously defending himself in the region of Korsun'-Shevchenkovskiy. The Second and Fifth Air Armies, which were supporting it, had a total of only 768 aircraft at their command and fell numerically far behind the enemy, who had concentrated up to 1,000 aircraft there.

The Commander of the Second White Russian Front, General of the Army G. F. Zakharov; Member of the Front-Line War Council, Lieutenant General N. G. Subbotin; and Commander of the Fourth Air Army, Air Force Colonel General K. A. Vershinin Evaluate a Plan for Waging an Air Strike. August 1944.

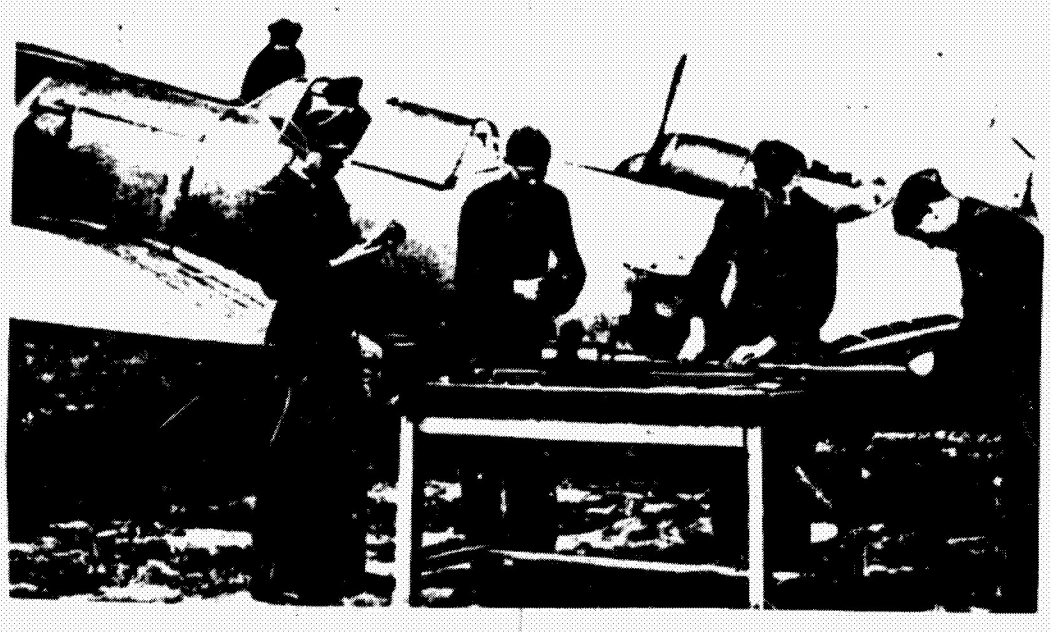
Air Force Colonel-General N. F. Papivin, Commander of the Third Air Army, with Fliers Designated Heroes of the Soviet Union. 1944.

Soviet and French Fliers after Returning from a Combat Mission.



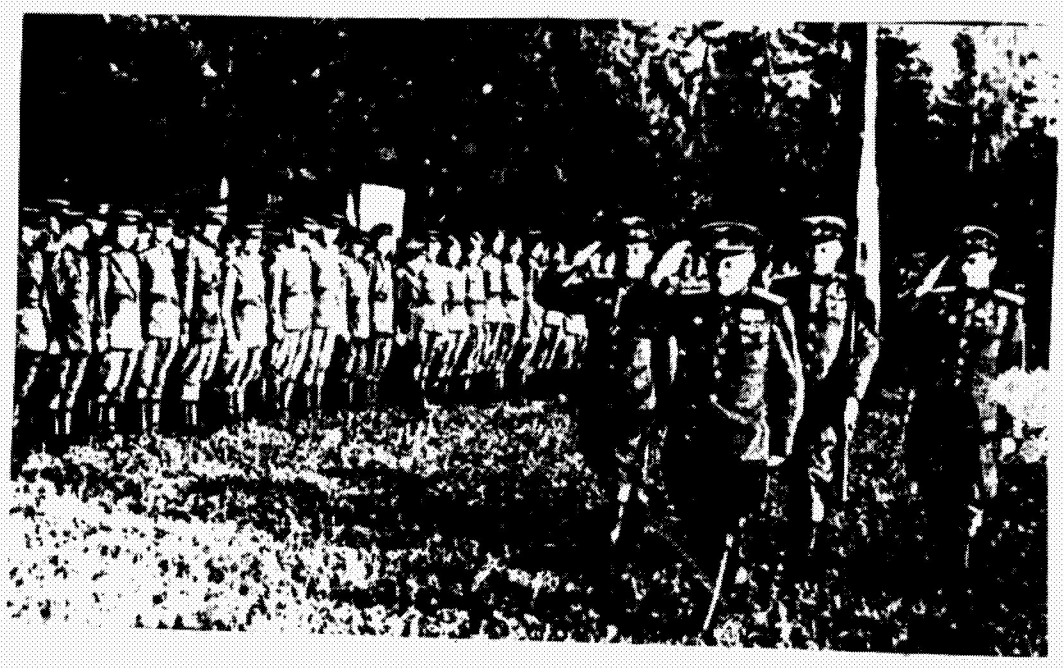
Colonel-General V. A. Frolov, Second in Command of the Troops along the Karelian Front, and Air Force Lieutenant General M. I. Sokolov, Commander of the Seventh Air Army, with Fliers Awarded the Rank of Hero of the Soviet Union.

In foreground (left to right): Air Force Major General M. G. Machin, Commander of the Fifth Fighter Air Corps; Marshal of the Soviet Union I. S. Konev, Troop Commander on the First Ukrainian Front; Lieutenant General K. V. Kraynyukov, Member of the War Council of the First Ukrainian Front; and Air Force Colonel General S. A. Krasovskiy, Commander of the Second Air Army, at an Airfield.



Aircraft Specialists of the First Czechoslovakian Fighter Air Wing Prepare an Aircraft for a Combat Mission.

NASA



Presentation of the Colors at the Military Academy for Command and Navigation Personnel.

In Poland. Children Enthusiastically Greet Soviet Aircraft.

The operation by our aviation was carried out under bad weather conditions. In addition, by late January and early February, our dirt airfields became useless due to the encroaching thaw. Only two or three useful airfields,

with 50 to 100 aircraft based at each, were at the command of our air armies.

However, even under these trying conditions, our ground troops received tremendous aid from the air. Operating precisely and with a maximum concentration of effort, our Soviet fliers not only hammered the enemy troops on the battlefield, but struck his reserves as well.

On 31 January, according to the data from the courageous aerial observer Captain G. T. Krasot, fliers from the Fifth Air Army attacked enemy trucks moving toward Shpola from the southwest. The enemy met our aircraft with heavy antiaircraft fire. Maneuvering skillfully, our fliers overcame this curtain of fire and dropped their bomb load against the columns stretched along the road. On the second day, in this same area, a heavy air strike was flown against a column of 70 enemy tanks. The movement of enemy reserves was brought to a standstill. At the same time, our troops succeeded in encircling the enemy's grouping at Kursun'-Shevchenkovskiy. In all, from 29 January to 3 February 1944 our Air Force flew 2,800 combat missions in this region, while the enemy flew only half as many [212]. /178

The Nazi Command attempted to aid its encircled troops. With the help of transport aviation, air drops began. At the same time, reserves were being brought up to break through the outer encirclement front. In the resultant circumstances, the Second Air Army and the Tenth Fighter Air Defense Corps (commander: General L. G. Rybkin) were assigned aerial blockade of the encirclement region, while the Fifth Air Army continued supporting the group troops at the outer encirclement front.

Despite difficult weather conditions, Soviet fliers waged resolute battle with the enemy aviation both on the ground and in the air. In only one day, on 3 February, units of the Tenth Fighter Air Corps (commander: General M. M. Golovnya) and the 264th Assault Air Division (commander: Colonel Ye. V. Klobukov) destroyed as many as 80 transport aircraft both in the air and on the ground at the air bases at Vinnitsa and Uman'. A total of 457 Nazi aircraft were destroyed both in aerial combat and at airfields during the rout of the encircled grouping [213]. Battle against the transport aircraft ended successfully. The air dropping of materiel for the encircled troops was foiled.

Our aviation offered great assistance to our ground troops in repulsing enemy counterattacks on the outer encirclement line around Tolmach and Lisyanka. An especially tense situation was created in this area on 4 February, when enemy tank units wedged their way into the defense of the 53rd Army of the Second Ukrainian front. Operating in small groups, assault aircraft from the Fifth Air Army destroyed enemy tanks and armored vehicles in the battlefield. Through the efforts of our Air Force and artillery, enemy attempts to break into the encirclement region were defeated. The fighting men of the 53rd Army were deeply grateful to the fliers for the assistance rendered.

When hope was lost for outside assistance, the Nazi troops remaining inside the pocket attempted to break out of the encirclement by themselves. On the night of 17 February, having formed themselves into columns, they moved from

the region of Shenderovka to the southwest. Despite snowfall and heavy wind, crews of the 312th Night Bomber Air Division (commander: Colonel V. P. Chanpalov) took to the air. Our fliers appeared suddenly over the enemy columns and bombed them. The Nazis took off running in panic but, in bolting from strikes by our aviation, they fell under the withering fire of our rocket artillery. Most were killed, and only a small group of tanks and armored transports succeeded in breaking out of the encirclement ring under the cover of a blizzard. /. 9

In this operation, our aviation played an important role in transport. During the spring thaw, when our roads were unsuitable for the movement of almost any type of transport, fuel and ammunition were delivered to our troops and the wounded were evacuated by air. The supplies were especially appreciated by our tank units which, in advancing, had isolated themselves from all their supply bases.

In March, after the troops of all four Ukrainian fronts were regrouped, the offensive was resumed with the object of completing the rout of the enemy's southern grouping. Actively supporting ground troops from the very first days of the operation, Soviet fliers aided them in breaking down the enemy defenses. Into the breaches were hurled tank commands which, advancing into an operational empty area, cut themselves off from all supply bases and were without artillery support. Our winged fighting men flew to the aid of our tank men. They destroyed enemy tanks and artillery, and brought up fuel and ammunition for our forward units by air When the conditions for our ground troops to make enveloping marches over spread-out roads across the fields became especially difficult, our Air Force proved to be an especially effective means of breaking up enemy troop maneuvers and disorganizing his retreat.

Aviators offered significant assistance to General I. A. Pliyev's mechanized cavalry group and General T. I. Tanaschishin's Fourth Guard Mechanized Corps, which were moving forward. The 306th Assault Air Division, in operating jointly with these advancing units, silenced the enemy's fire power, destroyed counterattacking tanks, and carried out aerial reconnaissance. Colonel A. F. Isupov, the division commander, led his subbordinates in carrying out the most responsible missions.

Combat missions by this brave unit commander usually ended in success, but during one of them, on 24 March 1944, his aircraft was downed by enemy fighters. While his engine was still functioning he turned his aircraft in the direction of his own troops, but he could not make it back to cross the front line. At the point where he made his forced landing (15 km from Novaya Odessa), the gravely wounded commander was captured. However, even in the Nazi torture chamber, Colonel Isupov continued his battle against the enemy. He distributed anti-Nazi propaganda among the prisoners and organized several escapes from the concentration camps. However, when Gestapo officers were around he spoke /180 boldly before all the camp inmates. Instead of propagandizing in favor of joining the Nazi Army, which the S. S. men demanded of him, he held traitors up to shame and pleaded with the prisoners not to taint the honor and worth of the Soviet fighting man and to be a true military servant until the very end.

A. F. Isupov was killed by the Nazi murderers. But until his last days he remained a true son of the Soviet people. His brave and courageous behavior while a Nazi prisoner was the extention of the same proud feats which he had performed during battle for his Fatherland.

With active air support, troops of the First, Second, Third and Fourth Ukrainian fronts dealt the enemy heavy losses during the winter and spring of 1944. The right bank areas of the Ukraine were completely liberated. The Soviet Armed Forces entered Rumanian territory. During this victorious offensive, Soviet fliers flew more than 70,000 missions and dropped thousands of tons of bombs against enemy objectives during the first three months of 1944 [214]. In aerial combat and on the airfields, they destroyed 1,467 enemy aircraft [215].

In pitched battles for the right-bank regions of the Ukraine, Soviet aviators demonstrated tremendous fearlessness and a high sense of mutual aid in combat. During one mission against an enemy airfield close to the town of Nikolayev, Second Lieutenant I. M. Stop, a flier in the 73rd Guard Fighter Air Wing, was downed and made a forced landing in occupied territory. A group of enemy mounted soldiers rushed toward his Yak-1. The flier was faced with either becoming a Nazi prisoner or death in an unequal battle. However, the assault airmen whom he had been covering did not leave their friend in trouble. They first attacked and scattered the cavalry detachment, and then one of them -- Second Lieutenant V. Ye. Milonov -- with his commander's authorization, landed next to the downed Yak. But the unforeseen happened: a wheel on Milonov's aircraft broke and he couldn't take off.

Then A. V. Demekhin, the group leader, and his second-in-command, Lieutenant P. N. Klyuyev, came to his aid. Knowing that the field where Milonov had landed was heavily broken up and it would be difficult to take off, Demekhin ordered Lieutenant Klyuyev to maintain cover, while he himself went ahead and landed. For several alarming seconds his aircraft stood next to that of the crew who had landed earlier. The fliers rapidly jumped into the back cockpit, and the gunners -- the undercarriage housing. Automatic weapons could be heard somewhere close, and bullets could be heard whistling. Nevertheless the two-seater Ilyushin, /181 this time with five men aboard, was already in the air. Passing over the front line, it landed safely at the first landing field it reached. The three pilots and the two gunners returned to their units. The homeland paid high tribute to the feats by the brave aviators. Andrey Demekhin was awarded the Rank of Hero of the Soviet Union, while Vladimir Milonov, Petr Klyuyev, and the aerial gunner were awarded military honors.

A. V. Demekhin

Many glowing pages in the chronicals of our Air Force's combat glory were written in those days by other pilots, navigators, gunners, engineers, technicians, and mechanics. Thousands of aviators who took part in liberating the right-bank areas of the Ukraine were granted government honors, and 18 of them were awarded the Rank of Hero of the Soviet Union. These included such renowned fliers as I. N. Kozhedub, A. V. Vorozheykin, A. S. Kumanichkin, V. I. Borodachev, N. F. Krasnov and many others.

No sooner had the battles along the right bank of the Ukraine quieted down than the operation for liberating the Crimea began. The Fourth Ukrainian front and the Separate Coastal Army, which were operating in this area, were supported by the Eighth and Fourth Air Armies, which had 1,167 aircraft against the enemy's 265 [216].

The assault against enemy fortifications at Perekop isthmus began on 8 April after artillery prepping and concentrated strikes by 108 Il-2 assault aircraft from the Eighth Air Army. Three days later, on the night of 11 April, the Separate Coastal Army launched its offensive in the Kerchenskiy Peninsula. When on the morning of 12 April our troops occupied Kerch', the enemy began retreating along the Peninsula, primarily by means of railway transport. Aerial reconnaissance picked out large concentrations of echelons with troops /182
and equipment along the railroad leading from Kerch'.

In this situation, the commander of the Fourth Air Army, General K. A. Vershinin, concentrated all his air strength to rout the troops retreating along the road. Group after group of assault aircraft and bombers took off from their airfields and rushed after the enemy.

The enemy suffered heavy losses. His attempts to pull his troops back to a defensive boundary were disrupted. With the active support from fliers of the Fourth Air Army and naval aviation our ground troops by dawn of 12 April had occupied the city and port of Feodosiya and had completely liberated the Kerchenskiy Peninsula.

In subsequent days, both air armies continued flying strikes against the enemy retreating toward Sevastopol. Our night bombers were especially active. They were constantly flying strikes against enemy troops attempting to retreat under cover of night. At the same time, our air armies flew strikes against enemy airfields, ports, ships and transports. Beaten enemy units retreating from the Kerchenskiy Peninsula were subjected to heavy aerial resistance in the region of Sudak. There, our bomber strikes sank five and damaged two self-propelled barges. The Nazi evacuation by sea was disrupted [217].

On the night of 15/16 April, our long-range bombers flew strikes against the enemy's amphibious vehicles in Sevastopol Bay. Flying 233 missions in two nights, our long-range fliers created 20 centers of fire at the railroad station and set fire to echelons and barges with troops and equipment, and blew up fuel and ammunition dumps [218].

On 19 April, troops from the Fourth Ukrainian front began preparing for

the assault against Sevastopol. Aviation units from the Eighth Air Army were shifted to front-line airfields. By late April, the Army had at its command air units from the Fourth Air Army, whose headquarters and control had been shifted to within the command of the Fourth White Russian front.

Six days prior to the assault of the Sevastopol fortified region, our long-range fliers and front-line bombers began preparatory aerial prepping, during which they dropped more than 2,000 tons of high-caliber bombs and approximately 24,000 small anti-tank bombs against the fortifications, port and concentrations of enemy troops [219]. /183

During the offensive against the Sebastopol fortified region, which began on 5 May, assault aircraft and bombers from the Eighth Air Army flew strikes against enemy artillery and mortar positions, and against their permanent defensive fortifications and troops. The group to hit the enemy most accurately on that day was the First Guard Assault Air Division (commander: Hero of the Soviet Union Lieutenant Colonel S. D. Prutkov). For successfully carrying out their combat missions, the War Council of the Second Guard Army congratulated all the flight and support personnel.

The day of 7 May was one of the most demanding with respect to aerial operations. The roar of engines in the air never ceased. Il-2 assault aircraft flew hedge-hopping attacks against the enemy, while above them were dive bombers. Everyone pushed toward Sevastopol. Our fliers demonstrated high combat skill and exceptional bravery. Enemy antiaircraft guns set up furious fire, but not a single aircraft deviated from its combat course.

The enemy put up especially stubborn resistance at Sapun-gora and the Sakharnaya Golovka heights. These heights were heavily fortified, and each time the attack by our troops would falter, our Il aircraft would appear over them. Our fliers would strafe enemy soldiers in trenches, and hit the enemy's artillery and mortor on the far slopes. Making use of active air support, our infantry occupied Sapun-gora and at 1830 hours, raised the Red Banner above the heights. During this day, Soviet fliers flew 3,000 missions and downed 53 enemy aircraft in aerial combat.

Today there is a monument set up at the Malakhovyy Hill to the fliers of the Eighth Air Army. It symbolizes the great skill, bravery, and heroism of our glorious aerial fighters who defended this heroic city in 1941 and routed the Nazis on the day Sebastopol was liberated in 1944.

With our Air Force enjoying continuous air supremacy, our ground troops approached closer and closer to Sevastopol. With unflagging strength, Soviet fliers continued their missions against the enemy. In the night of 8 May, a massive assault was carried out. Two hundred ten long-range bombers dropped 359 tons of bombs on enemy fortifications and troop defenses [220]. During the day, our armored Il's and dive bombers again appeared over the enemy positions. They attacked main points with bombs, rocket missiles, and machine-gun and cannon fire, they destroyed fire points, sank transports and ships in the bay, and struck the remainders of enemy aircraft at the airfields. Continuing their pressure against the enemy, our troops on 9 May 1944 breached the defensive /184

lines of the city and by 1900 hours, with a rush, they captured Sevastopol.

Monument to the Fliers Who Defended Sevastopol.

The remaining enemy troops who were retreating toward Cape Khersones hoped to be evacuated by sea. However, the enemy's convoy of transport vessels approaching from the sea was subjected to attack by our aviation and the fire from our long-range artillery. Thirteen transports loaded with troops and equipment were sunk at their mooring places in the bays.

While our Air Force was breaking up the evacuation of enemy troops, at 0300 hours on the morning of 12 May our ground units attacked the enemy by land. Having breached the last defensive positions, they wrapped up the rout of the enemy's Crimean grouping.

The Soviet Air Force played a substantial role in routing the enemy's 200,000-man army in the Crimea. During the battles for Sebastopol from 5 to 12 May they flew 13,000 missions. Each day they dropped thousands of bombs and rocket missiles against the enemy. In aerial battles and on the airfields, 540 enemy aircraft were destroyed at this time [221]. /185

The great successes and heroism of the personnel in our air armies was paid high tribute by the Communist Party and Soviet government.

Thousands of combat aviators were awarded Orders and Medals. The most outstanding of these -- General Ye. Ya. Savitskiy, First Lieutenant L. I. Beda and others -- became Heroes of the Soviet Union, while group commander V. D.

Lavrinenkov was awarded this high honor for the second time. Many air units and commands received the names Crimean, Sevastopol, Kerchenskiy, and Feodosiya.

Under the Wings of the Vilsa and the Balkans

In the summer and autumn of 1944, the Soviet Armed Forces successfully carried out their offensive operations. Crushing blows against the enemy followed one after the other: in the Baltic, in White Russia, in the western regions of the Ukraine, in Moldavia, and on Kol'skiy Peninsula. Having driving the enemy from our own territory, the Red Army extended a brotherly hand of aid to the peoples of South Eastern and Central Europe.

In the second half of 1944 the struggle intensified between troops and air units of countries from Central and Southeastern Europe and Nazi Germany. The Fourth Polish Combined Air Division, which had been formed in the Soviet Union, and later the First Combined Air Corps carried out combat operations on the first White-Russian front as part of the 16th Air Army. These air commands formed the nucleus for the subsequent development of the Polish Air Force.

In combat cooperation with the Soviet Air Force, fliers from Czechoslovakian and Yugoslavian units and commands formed and equipped with aid from the Soviet Union fought bravely as part of the Second, Eighth, and 17th Air Armies. The Rumanian and Bulgarian Air Forces took part in routing the enemy along the southern wing of the Soviet-German front.

The power of our Air Force constantly grew and became strengthened. In the first half of 1944, our aircraft industry produced 16,000 aircraft, which made up for losses and made it possible to form new Air Force units and commands. During the first five months of 1944, the number of aircraft in the /186
field army increased by 25%. Out of this number, almost all bombers and fighters being added to our armament were of new design. In 1944, manuals were put out on the combat operations of branches of aviation which were the result of the constructive generalization of combat experience. These manuals played an important role in further improving our fliers' combat skill.

Among the offensive operations in the second half of 1944, especially important was the White-Russian operation, which was carried out by troops of the First Baltic, Third, Second and First White-Russian fronts, forces from the Dnepr military flotilla, and White-Russian partisans. Those making up the front were the Third, First, Fourth 16th and Sixth Air Armies, numbering 5,700 combat aircraft (commander of the Third Air Army after 26 May 1943: General N. F. Papivin; commander of the First Air Army after 2 July 1944: General T. T. Khryukin; and commander of the Sixth Air Army: General F. P. Polynin). Our long-range aviation augmented the strength of strikes by our front-line air armies. Air defense fighters were used to cover front-line communications.

The coordination of the operations of all the aviations participating in the White-Russian operation was carried out by Air Force Marshal A. A. Novikov and General F. Ya. Falaleyev, representatives of the commander in chief for the Air Force.

The Yak-3 Fighter in Flight.

Along the central sector of the Soviet-German front, the enemy had disposed strong groupings of troops and aviation. In White Russia the "Center" army group and part of the forces of the "Sever (North)" and "Severnaya Ukraina (Northern Ukraine)" army groups were offering resistance. The enemy ground troops were covered and supported by 1,342 aircraft from the Sixth Air Fleet [222]. /187

The objective of the White Russian operation was to rout the troops of the "Center" army group and liberate the White Russian Republic. With this intention on the part of the Soviet Command, it had been decided to throw converging strikes in the general direction of Minsk, to surround and destroy first the enemy's flanking (Vitebsk and Bobruysk) groupings, and then the main forces of the "Center" army group in the region east of Minsk.

In the impending operation, a vital role was delegated to the Air Force. Our front-line and long-range aviation were given these missions: to rigorously maintain air supremacy; to support ground troops in breaching the enemy's defenses, encircling and routing the Vitebsk and Bobruysk groupings, and in surrounding and destroying the main forces of the "Center" army group to the east of Minsk; prevent the enemy from bringing up reserves from the rear to the battlefield, and break up the retreat of enemy troops to the west; and finally, maintain continuous aerial reconnaissance.

The Soviet Air Force prepared for the operation in every way. Special attention was given to supporting the rapid advance of tank troops, who had been given a vital role in surrounding the enemy's main troops to the east of Minsk. After breaching the defenses, up to 75% of our aviation forces would be shifted to covering and supporting tank armies and corps and our

Even Roman odd

mechanized cavalry groups. The air army headquarters sent operational groups of officers into the troops and gave them the responsibility for constantly maintaining coordination and directing the Air Force units which were carrying out missions in the interests of ground troops, especially tank units.

Ten days prior to the beginning of the White Russian operation, our long-range Air Force carried out an aerial operation aimed at destroying enemy aircraft at their airfields. Mass strikes were flown against eight base airfields, where our aerial reconnaissance had uncovered large concentrations of aircraft. During these strikes, fliers from our long-range air corps flew approximately 1,500 combat missions and inflicted heavy losses to the enemy Air Force [223].

During the night of 23 and 24 June, our Air Force carried out preparation of the offensive along the lines of the Third, Second, and First White Russian fronts. Our long-range and front-line bombers attacked the most /188
important enemy strong points along sectors of the breaches in the defense, flying approximately 1,450 combat missions [224]. By means of precise bombing strikes, our fliers destroyed many enemy defensive installations, disrupted his fire system, and inflicted heavy losses against his troops. In the sector of the Third White Russian front, the operations by our night aviation were augmented by a strike of 160 day bombers, which was carried out at dawn on 23 June. On the other fronts, the morning fog did not permit our day aviation to take to the air.

After aerial and artillery prepping, our infantry and tanks attacked the enemy positions. As soon as the fog broke up, our assault and bomber aviation joined in supporting the advancing troops. Groups of Il's constantly struck the enemy's artillery, mortor and troops on the battlefield, giving him no chance to strengthen his temporary positions or to establish defense and carry out well-directed fire against our troops. During this time, our bomber units flew strikes against advancing Nazi reserves.

On the evening of 23 June, the forward units of the Third White Russian front approached the towns of Gormana and Kireyevo, which the enemy had converted into major defensive centers, having built many earth-and-timber positions there. To hold back the advance of Soviet troops, the Nazi Command had strengthened the garrisons of these defensive points with artillery, tanks and infantry. The danger arose of slowing down the speed of our offensive. Under these circumstances, our aviation secured us success: 162 bombers and assault aircraft from the First Air Army destroyed the enemy defensive positions, artillery, and troops with heavy strikes. After this, our tankmen and infantry seized these strong points of Gormana and Kireyevo at a rush.

The troops of the Second White Russian front encountered heavy fire resistance to the east of Mogilav. The enemy artillery was firing directly on to our advancing troops from the region of Raducha, and the infantry had dropped to prone positions under enemy fire. General S. G. Get'man, commander of the 230th Assault Division, called for our aviation to destroy the enemy batteries. Soon, the first two groups of assault aircraft headed by Major G. N. Papka and First Lieutenant T. A. Kucheryab approached the battlefield.

Our artillerymen precisely designated the targets with signal shells, and our fliers struck the enemy's guns with precise flights at an altitude of 100-150 meters. The fire from the enemy positions was silenced, and the Soviet troops resumed their offensive [225].

After two days, the Soviet troops had breached the enemy's tactical defenses with the active support of our aviation. A great avalanche of tank and mechanized units poured through the resultant breach. During this time, our Air Force's main efforts were directed toward covering and supporting our ground troops. /189

On the Third White Russian front, bombers and assault aircraft from the First Air Army were sent into action primarily in the interests of the Fifth Guard Tank Army. Its commander sent an operational group of officers headed by General V. A. Ushakov to the observation point. They controlled aviation and coordinated its efforts with the operations of tank units. Upon call by the operational group, assault and bomber fliers destroyed columns of enemy troops on the Orsha-Borisov Highway, on dirt roads in the region of Senno, Smolyana, and Tolochin, as well as flying strikes against railroad stations and echelons. Troops of the Fifth Guard Tank Army supported by aviation constantly beseiged the highway and railroad lines from Moscow to Minsk and swiftly pursued the enemy toward Borisov.

On the first White Russian front, the tank corps in coordination with units from the 16th Air Army rapidly moved forward in order to encircle the enemy's Bobruisk grounding. The 199th Assault Air Division successfully supported the Ninth Tank Corps. It air representative, Major I. I. Dvornikov, who was at the tank corps commander's command point, sent assault aircraft into battle where necessary and directed to destroy artillery, mortar and other enemy objectives. "For fine coordination in the Ninth Tank Corps's advance" -- wrote its commander to the commander of the 16th Air Army, -- "I take this opportunity to extend my thanks to the commander of the 199th Assault Air Division, Colonel N. S. Vinogradov, and the entire flight personnel entrusted to his division "[226]. For his skillful control of the operations by assault fliers in battle, Major Dvornikov was awarded the Order of the Red Banner.

Strikes by ground troops and aviation, coordinated both in time and location, achieved a rapid breach of the enemy's defenses and the destruction of substantial forces of the "Center" army group. During the first four days of the operation, our Air Force flew approximately 28,000 combat missions. In aerial combat and at the enemy's airfields, he lost 180 aircraft.

Successfully carrying out the offensive deep into operational territory, Red Army Tank and Mechanized units in the regions of Vitebsk and southeast of Bobruisk surrounded two Nazi groupings. The enemy attempted to break out of the encirclement. On 27 June, the Nazi troops which had fallen into a pocket outside Bobruisk concentrated along the Zhlobin-Titovka road, planning to rapidly ram through the Ninth Tank Corps's hastely occupied defense. However, aerial reconnaissance uncovered the Nazi preparation for the breach. There was little time to concentrate Soviet troops along the threatened region, and the commander of the First White Russian front decided to send in the Air /190

Force to break up the enemy's preparation for the counterthrust. Upon his telephone order, the commander of the 16th Air Army, General S. I. Rudenko, quickly sent 526 aircraft into the air.

The mass attack lasted an hour and a half. The bombers and assault fliers dropped 159 tons of bombs, fired approximately 600 rocket missiles, and expended tens of thousands of shells and rounds against the enemy. The last air groups left the battlefield only at dusk. Our fliers destroyed 150 tanks, 6,000 trucks, and much enemy artillery. The Nazis lost up to 1,000 soldiers and officers dead [227]. Overwhelmed by panic, the enemy troops broke ranks and headed into the surrounding woods. On the next day, the surrounded enemy grouping numbering five divisions was completely routed.

The remains of the beaten troops hurriedly retreated west. The Nazi Command immediately began shifting divisions from other sectors of the Soviet-German front and from occupied countries in Western Europe to White Russia, hoping to close the breach formed in their troops' defenses.

Our Air Force was faced with vital and complex missions: disrupt the enemy's orderly retreat to the west and prevent his reserves from advancing. Bombers from the Third, First, and 16th Air Armies as well as long-range aviation, assigned these missions, flew strikes against the railroad centers and stations at Daugavpils, Molodechno, Minsk, Negoreloye, Baranovichi, and Luninets. A total of approximately 4,000 combat missions flown by our Air Force resulted in paralyzing movements along the railroads. The enemy reserves, having suffered heavy losses, arrived at the front behind time and were sent into combat without coordination. This created favorable conditions for destroying them in units.

Our aviation relentlessly destroyed the retreating enemy troops as well. Fliers from the First Guard Assault Division on 26 July alone, destroyed 15 echelons with troops and equipment, and ten engines. On the same day, along the Orsha-Borisov Highway, our Air Force set fire to and put out of commission /191
approximately 4,000 trucks, destroyed no fewer than 500 vehicles and inflicted heavy casualities against the enemy troops [228].

On 29 June, troops from the Fifth Guard Tank Army, supported by the Air Force, forced the Berezina River and occupied Borisov. During these battles, fliers from the Women's 125th Guard Bomber Air Wing (commander: Lieutenant Colonel V. V. Markov) distinguished themselves. Groups of Petlyakov aircraft under the command of Captains Nadezhda Fedutenko, Glavdiya Fomichevaya and Maria Dolina, flawlessly destroyed enemy artillery, mortar and troops occupying the western bank of the Berezina and Borisov. For its successful combat operations, the 125th Guard Bomber Air Wing was granted the honorary designation Borisovskiy.

With the active support of the Air Force, Soviet troops constantly pursued the enemy and, on 3 July 1944, liberated the capital of White Russia, Minsk. In the woods to the southeast of Minsk, disordered groupings of enemy troops numbering up to 100,000 fell into an encirclement. Air units from the First and Fourth Air Armies took part in routing these forces along with our

front-line troops. Our aerial observers flew constantly over the region where the Nazis were encircled. In scanning the woods from low altitude, they flawlessly uncovered enemy concentration points. Especially accurate and effective was the reconnaissance carried out by Hero of the Soviet Union Lieutenant Colonel P. K. Kozachenko. He took off ten times to carry out aerial reconnaissance, and each time he brought back valuable information concerning the enemy troop groupings and activities. On the basis of this reconnaissance data, assault and bomber aircraft took off immediately and hit the Nazi troops which had fallen into the pocket with bombs and machine-gun and cannon fire.

The Secretary of the Communist Party Central Committee in White Russia, Comrade P. K. Ponomarenko, examined the results of the combat missions by our Air Force and wrote to the representative of the commander in chief, Marshal of the Soviet Union A. M. Vasilevskiy: "The other day, in the woods to the southeast of Minsk, we observed a large fortified camp of Germans which had been completely destroyed by our assault aviation. This region gives a tremendous impression of the scale of their defeat and the demonstration of the power of our Air Force. Upon inspection, we observed up to 5,000 dead soldiers and officers, around 5,000 burnt-out and destroyed trucks and tanks, and destroyed defensive equipment everywhere "[229].

By 8 July, the combined forces of our ground troops and aviation completely routed a 100,000-man grouping of Germans surrounded to the southeast of Minsk. /192

After defeating the enemy outside Minsk, fliers from the First Air Army took active participation in the battles for Vilnius. On 12 July, before the assault of the city, 103 bombers and 51 assault aircraft flew missions against the enemy's defensive fortifications and fire points [230]. After a few hours, troops from the Third White Russian front occupied Lithuania's capital city, Vilnius.

Pushing rapidly west, by late July troops along the first White Russian front supported by the 16th and Sixth Air Armies had successfully carried out the Brestsk-Lyubinskaya operation, and had forced the Vistula River in the region of Pulava and Magnushev. In broadening the beachhead, fierce battles were fought with the enemy. The Nazis had concentrated several bomber and fighter squadrons along the Warsaw and Radonsko aerial centers, and had begun flying heavy strikes against our river crossings and troops. To break the enemy's air resistance, the Soviet Command took several steps. Fighter wings were rapidly shifted toward the region of the beachhead. Ground troops and the local populace were both used to build and maintain repair the front-line airfields. Radar stations were moved up to threatened areas and made it possible to observe the enemy's aerial operation even at the distant approaches to the battlefield.

Fierce aerial encounters took place in the region of the beachhead and the crossing over the Vistula. Heavy losses forced the enemy to cut down the activity of his combat operations in the air. With the help of our Air Force, the Soviet troops not only held but also broadened the beachhead on the western back of the Vistula.

In the concluding stage of the White Russian operation, and later during battles to completely liberate Poland and achieve the destruction of Nazi Germany, Soviet and Polish fliers flew together in the same ranks. The Polish assault and bomber aircraft destroyed the enemy's fire points and troops in the battlefield, operated against counter-attacking groupings, and destroyed aircraft at the airfield; the fighters covered our troops and rear-area objectives from strikes by Nazi aircraft. From mid-August 1944 to the end of the war, the Polish Air Force flew over 6,000 missions along the Soviet-German front. In aerial encounters, Polish fliers downed 24 German aircraft. Especially outstanding was Second Lieutenant V. S. Kalinovskiy, who flew 120 combat missions and destroyed two Focke-Wolfe's, as well as Second Lieutenants P. N. Khausovich and Yu. I. Kozak, who each flew 50 combat missions. /193

The White Russian operation ended in magnificent victory. The enemy's "Center" army group was destroyed. The Red Army had liberated White Russia, a substantial portion of Lithuania, and part of Latvia. The eastern portion of Poland had been cleaned of Nazi invaders.

The scope of the combat operations of our Air Force during this operation was vast. Flying 153,000 combat missions, Soviet pilots proved a significant help to our ground troops in breaching the enemy's defenses and developing our rapid offensive to the west [231]. With crushing blows from the air, they destroyed surrounded enemy groupings near Vitebsk and Bobruisk, Minsk and Kaunas, Vilnius and other places. With the support of assault and bomber aircraft, our front-line troops rapidly forced many major rivers: the Vistula, the Nieman, the Narev and the Berezina. Our fliers constantly maintained air superiority and prevented the enemy Air Force from striking our troops and objectives behind our lines.

At the height of the successful offensive by the Red Army in White Russia, troops of the First Ukrainian front on 13-14 July struck a new crushing blow against the enemy in the western regions of the Ukraine. In this operation, given the code-name L'vovsko-Sandomirskaya, the offensive moved out along two directions: toward L'vovsko and toward Rava-Russkaya. The Second Air Army, with over 3,000 combat aircraft, maintained air support and cover of ground troops.

The troops of the First Ukrainian front were resisted by the "Northern Ukraine" army group, which created a multiple-line defense up to 50 kilometers in overall depth. The Fourth Air Fleet, numbering more than 700 aircraft, engaged the enemy's ground troops [232].

Toward L'vovsko, on the night preceding the offensive, 58 long-range bombers attacked the L'vovsko and Turbya airfields. During this time, Po-2 aircraft from the 208th Night Bomber Division struck against enemy troops and reinforcements in the region of Zolochev. During the first half of 14 July, ten minutes prior to the attack by our troops, 252 Pe-2 bombers flew a strike against enemy strong points and troops on the first line of defense [233]. When the infantry and tankmen went on the offensive, 366 assault aircraft dropped bombs and opened machine-gun and cannon fire against the enemy artillery /194 and mortar. Later, fliers of the First Guard and Eighth Assault Air Corps

(corps commanders: Generals V. G. Ryazanov and V. V. Naneyshevili) constantly supported our advancing troops.

The enemy attempted to stop the advance of Soviet troops with artillery and counterattacks. The Nazi German Command began to throw its reserves into the region of the breach. It was under these conditions that our Air Force was directed to attack and destroy enemy fire points for counterattacking tanks and reserves. Toward evening of 14 July, 500 bombers and assault aircraft attacked enemy tank units moving from the region of Sasov and Zolochev and set fire to 40 tanks and 80 trucks.

Nevertheless, by the morning of 15 July the enemy had concentrated as many as two tank and one infantry divisions in the region of Zborov, Pluguv and Zolochev, and had started a fierce counterattack along the flank of the main grouping of the first Ukrainian front.

Under these difficult circumstances, our Air Force came to the aid of our ground troops. By order of the commander of the First Ukrainian front, all the air army's strength was thrown into repulsing the counterattacking enemy. For five hours, approximately 2,000 aircraft destroyed enemy tanks and artillery. During the fiercest moments, up to 1,000 of our aircraft were over the battlefield. Fliers from the Second Guard Bomber Corps, commanded by General I. S. Polbin, operated with dive bombers and inflicted great damage against the enemy. "We have been fighting since the very first days of the war, but we have never before seen such outstanding aerial operations,"[234] -- wrote the fighting men of the 70th Guard Infantry Division to the fliers.

The enemy's tank grouping suffered heavy losses and was forced to give up the counterattack. "On 15 July, the Air Force saved the 38th Army under critical circumstances "[235]. This is the way Marshal of the Soviet Union I. S. Konev, commander of troops on the First Ukrainian front, described the activity of our air units.

The enemy's attempt to bring up fresh troops and reorganize the counter-attack had been thwarted by our Air Force operations. This is clearly witnessed by the acknowledgement given by the Nazi General F. Mellenthin: "While on the march, the Eighth Tank Division, moving in long columns, was attacked by the Russian Air Force and suffered heavy losses. Many tanks and trucks were burned; all hope for a counterattack had been destroyed "[236].

Toward Rava-Russkaya, reconnaissance units of the First Ukrainian front /195
on the night of 13 July observed an intended enemy retreat. The Nazi German Command was attempting to secretly draw its troops back to the second line of defense with the idea that our artillery and air prepping would be carried out against empty positions. However, this enemy intention did not bear fruit. Soviet troops immediately launched an offensive without artillery and air prepping.

Our air units were given this mission: prevent the enemy's retreat and destroy him as he moved along the roads. Our assault fliers rushed to carry it out. They constantly flew strikes against retreating Nazi columns. At the

same time, our bomber aviation destroyed advancing reserves and enemy crossings over the Zapadnyy Bug.

Soviet fighters engaged enemy bombers attempting to fly strikes against troops and objectives behind the front lines. On 14 July, 12 of our fighters headed by Colonel A. I. Pokryshkin, commander of the Ninth Guard Fighter Division, were covering our troops in the region of Radzekhuva. Flights were being headed by Captain G. A. Rechkalov and First Lieutenant A. I. Trud. Suddenly 40 German bombers with fighter escort approached the cover region. Then Pokryshkin ordered First Lieutenant Trud's flight to engage the enemy fighters, while all the others set about destroying the enemy bombers. A headlong attack -- and three flaming Junkers fell to earth. The enemy's ranks were broken. A second run -- and two more German aircraft fell. Unable to withstand the attacks by our gallant Soviet fighters, the enemy bombers dropped their bombs on their own troops and retreated. However, our fliers, in pursuit, downed four more aircraft. We, in turn, suffered no losses [237].

The pilot M. P. Devyatayev was downed on 13 July in an unequal battle against numerically far superior enemy forces. Almost unconscious and severely wounded, he bailed out of his flaming airplane. He came to himself only that night in the pit of a Nazi torture chamber. Then began days full of horror. Unsuccessfully attempting to force the Soviet flier over to their side, the Nazis subjected him to horrible torture and beatings. But none of their torture broke the hero. On 8 February 1945, prisoners including Devyatayev were working at an airfield cleaning the runway. Taking advantage of the right moment, they killed their guard. Devyatayev jumped behind the stick of a He-111 bomber. The Nazis ran toward the aircraft from all sides. /196
When they were already close, the aircraft slowly picked up speed and took off. Fighters took off in pursuit. But Devyatayev aimed his craft confidently eastward, and touched down on our own territory. Thus, thanks to the bravery of this Soviet flier, a group of ten prisoners of war succeeded in escaping from Nazi captivity. On 15 August 1957, M. P. Devyatayev was awarded the Rank of Hero of the Soviet Union. During the war he flew 180 combat missions and downed nine enemy aircraft.

The troops of the First Ukrainian front, with constant air support, broke narrow breaches in the enemy defenses in fierce battles. Three tank armies and two mechanized cavalry groups advanced through the resultant breaches. At this point our Air Force began operating to assist these armies and groups.

Around L'vovsko, in a narrow band called the Koltuv Corridor, the Third Guard and Fourth Tank Armies were sent into the breach. The enemy artillery opened heavy fire against these troops. At the same time, enemy tank units launched a counterattack. The Soviet command used the main forces of the Second Air Army -- six air corps and three separate air divisions -- to support these tank armies in forcing their way into the breach and then supporting them./197
Fliers from the Second Guard and Fourth Bomber Corps flew strikes against enemy flank groupings in the regions of Sasov, Koltuv, Belyy Kamen', Pluguv and Zolochev, and assault aircraft from the First Guard and Eighth Assault Corps attacked the enemy artillery and mortar along the flanks and in front of the tank units. V. I. Andrianov, T. Ya. Begel'dinov and many others who were

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expert at assault missions would take to the air three or four times a day and strike the enemy. Our fighters covered our tank troops, and never let the enemy Air Force reach the field of battle.

In support of the Third Guard and Fourth Tank Armies, our air units in only the first three days flew 4,500 combat missions. But as a result of this active aerial support, our tank troops push decisively westward. In the region of Broda they surrounded the remnants of eight enemy divisions. After this the Second Air Army directed its efforts at destroying the enemy's surrounded grouping. Weakened by air strikes, the enemy grouping at Broda was rapidly eliminated by our troops. Captured soldiers and officers attested to the fact that the surrounded troops suffered their heaviest losses to our aviation.

On 22 July, troops of the First Ukrainian front reached the outskirts of L'vovsko and began house-to-house fighting. Fearing encirclement, the Nazis began to rapidly retreat toward Sambor. On the basis of our reconnaissance observations, Soviet bombers struck against the columns of retreating troops with precise bombing runs. On the morning of 27 July, L'vovsko -- the main city in the Oblast, and the major road and industrial center of the Ukraine -- was completely cleaned of enemy troops.

The air units and commands which were most outstanding in these battles were awarded the honorary names of L'vov; these included the Fifth and Seventh Fighter Corps (commanders: Generals D. P. Galunov and A. V. Utin), the Second Guard and Fourth Bomber Corps (commanders: Generals I. S. Polbin and P. P. Arkhangel'skiy) and the Eighth Assault Air Corps (commander: General V. V. Naneyshvili), as well as the 236th (commander: Colonel V. Ya. Kudryashov) and 331st (commander: Colonel I. A. Semenenko) Fighter Air Divisions, and the 50th Reconnaissance Air Wing (commander: Lieutenant Colonel G. G. Bystrov).

The troops from the "Northern Ukraine" army group, which were routed near L'vovsko and Rava-Russkaya, began to hurriedly retreat. Swiftly pursuing the enemy, by late July units from the First Ukrainian front had reached the Vistula and had forced it at a rush.

Especially successful was the forcing in the region of Baranuv by troops from the 13th and First Guard Tank Armies. The enemy attempted to destroy the beachhead Soviet troops had secured on the western bank of the river at any cost. Enemy infantry and tanks undertook fierce counterattacks. In the region where the Soviet troops had forced the Vistula, the Nazis threw almost the entire forces of the Fourth Air Fleet. Enemy bombers in groups of 40-50 aircraft flew missions against the crossing and troops on the beachhead. /199

As a result of the enemy's substantial air activity, the War Council of the front issued a special resolution on strengthening the antiaircraft defense of the crossing over the Vistula. In accordance with this resolution, our fighter air units were shifted closer to the Vistula. In the region of Baranuv, a radar-equipped fighter control point was established. Antiaircraft units were sent to the crossing.

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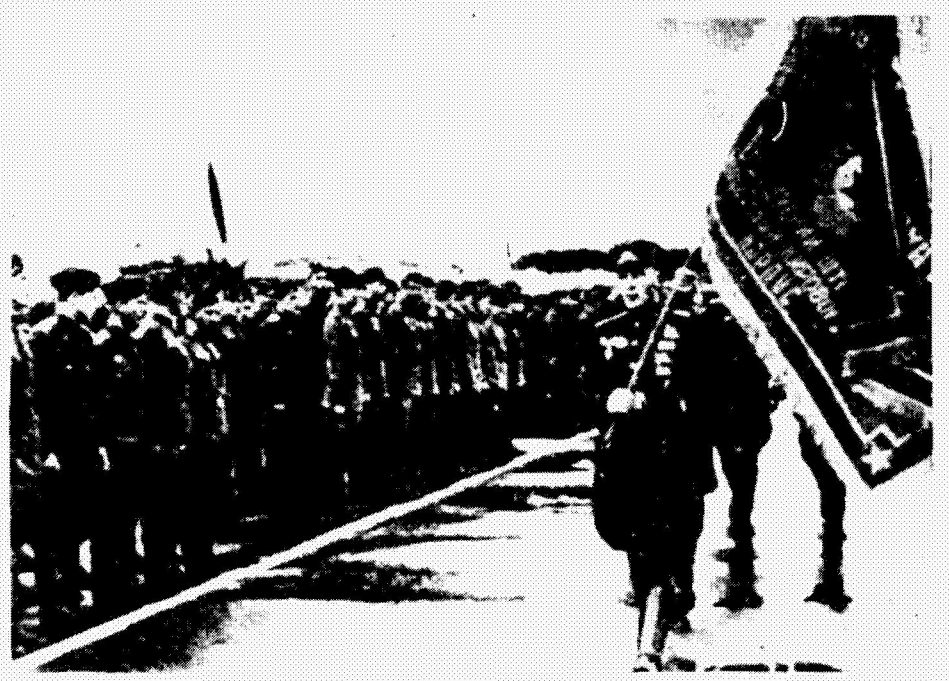

Presentation of the Guard Banner to the First Guard Assault Air Corps. Carrying the Banner -- Air Force Lieutenant General V. G. Ryazanov, Corps Commander and Twice Hero of the Soviet Union.

As a result of the measures taken, the situation in the air proved favorable for operations by our Air Force. Soviet fighters, making use of radar data, intercepted German bombers while still on the approaches to the battle zone. Enemy aviation losses rose daily. Whereas on 1 August, four enemy aircraft were downed over the Vistula, on 5 August the number reached 19, [238]. The Nazi Command's plan to stop the Soviet troops from crossing the Vistula through the use of counterattacking troops and air strikes was foiled.

Fierce battles took place at the Vistula beachhead. On 17 August in the region of Stopnitsa, large numbers of enemy infantry supported by tanks launched a counterattack. A stubborn battle resulted. Along with the infantry, tanks, and artillery, valiant Soviet assault fliers flew careful strikes against the enemy. Captain A. P. Kompaniyets's assault group struck the enemy personnel and equipment mercilessly. Captain M. P. Odintsov's group was not lacking in skill or precision in its attack, Soviet fliers set fire to several enemy tanks and trucks with precise strikes on the very first target run. Attacks by assault aircraft followed one after the other. As a result of this assault strike, more than 15 tanks and hundreds of enemy soldiers and officers were destroyed. For outstanding combat operation by the assault pilot, the commander of the Fifth Guard Army, General A. S. Zhadov awarded Captain Kompaniyets the designation Sentry [239].

On 18 August, troops on the First Ukrainian front, supported by aviation, occupied the city of Sandomir, and broaden the beachhead to 75 kilometers along the front and 50 kilometers in depth. The main troops along the front were concentrated there. /200

Fliers from the Ninth Guard Assault Air Division -- Experts in Supporting Troops on the Battlefield. Seated (left to right): V. I. Andrianov, I. T. Gul'kin, F. A. Agal'tsov, M. P. Odintsov, and I. Kh. Mikhaylichenko; standing: T. Ya. Begel'dinov, A. S. Butko, N. G. Stolyarov, I. A. Antipin, S. G. Chepelyuk and M. I. Mochalov. 1944.

Stubborn battles for this beachhead continued until the end of August. The Air Force was a constant reliable aid to our ground troops.

On the evening of 27 August, a group of enemy tanks broke through positions held by Soviet troops and began shelling the observation point maintained by the commander of troops at the front. A flight of assault aircraft commanded by Lieutenant M. M. Glevov over the battlefield at that moment was ordered to attack the enemy tanks.

The first air strike was made -- and the two leading tanks were engulfed in flames. The second run -- and two more tanks were damaged and out of action. The remainders to flee. For their outstanding actions, the commander of troops at the front awarded all four fliers the Order of the Red Banner [240].

During the battles for securing and extending the Sandomir beachhead, pilots flew 17,000 combat missions and took part in up to 300 aerial encounters in which more than 200 enemy aircraft were downed [241].

As a result of the L'vovsko-Sandomir operation, the Nazi "Northern Ukraine" army group suffered complete defeat. Soviet troops liberated the western regions of the Ukraine and the southeastern section of Poland, and occupied a large beachhead on the Vistula. During this operation, pilots flew 48,000 combat missions and played a significant role in achieving victory.

After July 1944, the First Czechoslovakian Fighter Air Wing began its combat activity as part of the Second Air Army. They were equipped with Soviet La-5 aircraft and had been trained for their combat operations by our flight and support personnel. In September of 1944, the base for the Czechoslovakian fliers was shifted to the region of Zvolen. For over a month they were there behind enemy lines actively supporting Slovak rebels. Those who distinguished themselves in fierce battles were wing commander F. Faytl, and the pilot Yu. Steglik, L. Shrom, F. Khabera, F. Shtychka and P. Kotsfel'da.

Later, the First Czechoslovakian Combined Air Division was created, equipped, and trained in the USSR. Fighting in the same ranks with Soviet aviators, Czechoslovakian pilots flew more than 1,400 combat missions and destroyed approximately 50 Nazi aircraft by the end of the war.

On 20 August, while the Red Army was successfully carrying out its Belorussian and L'vovsko-Sandomir operations, our country celebrated Aviation Day. The homeland showed its appreciation of the remarkable feats by our winged fighting men. On this day, the Soviet government awarded the renowned flier A. I. Pokrishin his third Gold Star, gave Major A. V. Vorozheykin and Captain I. N. Kozhedub their second Gold Stars and designated 12 fliers the Rank of Hero of the Soviet Union. /201

While artillery salvoes were still thundering and bombs were still falling over the Vistula, the Red Army was already unleashing new all-out battles for liberating Rumania and Bulgaria.

On the morning of 20 August, troops of the Second and Third Ukrainian fronts supported by the Fifth and 17th Air Armies, along with forces from the Black Sea Fleet, began the Yassk--Kishinev operation. They were faced with destroying the more than 47 enemy divisions which made up the "Northern Ukraine" army group, and which were supported by 810 aircraft from the Fourth German Air Fleet and the Rumanian Air Force [242]. Our Air Force had 1,759 aircraft and thus enjoyed a two-fold numerical superiority.

Soviet troops needed some time to break down the enemy's resistance. The enemy was weakened and demoralized by fierce air strikes and artillery fire. With powerful air support, our infantry rapidly breached his defenses. On the second half of the first day of the offensive, our forward troops pushed into the breach. The Sixth Tank Army, and individual tank mechanized corps were given the mission of surrounding the enemy's main forces. Our own main aviation forces were directed toward covering and supporting our tank and mechanized units.

Our fighters engaged in fierce aerial combat with the enemy Air Force, which was attempting to fly strikes against our tank troops. On the very first day of the encounter, they downed 50 aircraft.

In the region of Yass, ten Soviet fighters commanded by Lieutenant Colonel A. A. Oboznenko encountered approximately 80 enemy aircraft. With a headlong attack, our pilots broke up the bombers' combat formation and downed several of them. A second attack by brave Soviet aces caused panic among the enemy bombers who, hurriedly releasing their bombs, retreated. In this aerial encounter, Lieutenant Colonel Oboznenko's fighters destroyed seven enemy aircraft.

With precise bombing strikes and machine-gun and cannon fire, our assault aircraft cleared the way for Soviet troops.

In the region of Chemishliya, Batyr' and Taraklya, the enemy's Thirteenth Tank Division was concentrated with the objective of counterattacking. Upon orders from the commander of troops of the Third Ukrainian front, our assault aircraft took off to destroy them. The group of aircraft from the 951st Assault Air Wing headed by Hero of the Soviet Union Major A. I. Kobelev were outstanding in this encounter. In three runs, the group commander set fire to three enemy tanks. Following his example, Lieutenants I. Ye. Kolesnichenko, Ye. T. Korpachev and B. A. Drobinin each destroyed two enemy tanks. Other groups performed equally well. The enemy tank grouping was destroyed. As a result of this, the combat operational journal for the Sixth German Army for 21 August 1944 read: "Our command's decision to use the 13th Tank Division to close the breach formed yesterday has proved impossible "[243]. /202

Our bomber aviation flew strikes against the enemy's communications and deep behind his lines at his reserves. First Lieutenant Ye. A. Myasnikov's flight was assigned the mission of destroying the railroad station at Kaynara, through which enemy reserves were moving. No sooner had the bombers approached the target than the flashes from shell explosions could be noted along their path. As First Lieutenant Myasnikov assumed his mission course, the aircraft next to him was hit by a shell. His aircraft was tossed to the side by the explosion wave. Holes were ripped in the plating of his aircraft, and it started responding poorly to the controls.

Under these difficult circumstances, the pilot would have been justfied in quickly dumping his bomb load and heading for a safe area. But First Lieutenant Myasnikov, decorated four times, calmly leveled off his aircraft and led his wing to the attack. Their bombs fell on target. Through this precise strike, First Lieutenant Myasnikov's flight caused explosions of tremendous force which destroyed as many as eight enemy railroad echelons. The Kaynara station was knocked out of commission for a long while [244].

When the aircraft pulled away from the target, the enemy increased his antiaircraft fire. Another enemy shell burst under First Lieutenant Myasnikov's aircraft. The navigator was wounded with shrapnel, the fuel tanks were ruptured, and the left broke into flame. But the courageous pilot still didn't lose his nerve. With a deep slide, Myasnikov extinguished the flames and, on one engine, led his damaged craft back to its home air base. His comrades in arms closed ranks even tighter, ready to protect their commander from possible

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attack by Nazi fighters. They soon left the front line behind them. Myasnikov reached his airfield and landed safely. The wing commander warmly congratulated him for his successfully completed 200th combat mission. First Lieutenant Myasnikov was later awarded the Rank of Hero of the Soviet Union. /203

On 24 August, tank troops from the Second and Third Ukrainian fronts, actively supported by aviation, completed their encirclement of the main forces from the "Southern Ukrainian" army group. On the same day, Kishinev, the capital of the Moldavian SSR was liberated.

Encircled southwest of Kishinev, the Nazi troops put up fierce resistance. They undertook repeated attempts to break out of the encirclement. In the region of Sarata Razem, the enemy succeeded in pressing units of the Fourth Guard Mechanized Corps. A difficult situation resulted. Upon a request for aid from the corps commander, Colonel A. V. Ivanov's 306th Assault Air Division responded in a few minutes with group raids of assault aircraft at the battlefield. The strikes by Soviet aviators were precise and without resistance. The fliers set fire to enemy tanks, and forced the enemy soldiers and officers to the ground with precise machine-gun fire and shells.

Confusion was spread through the enemy ranks. Our troops, supported by aviation, repulsed the enemy and began pushing forward. The commander of the Fourth Guard Mechanized Corps, General V. I. Zhdanov, warmly thanked the assault fliers for their timely aid.

Our ground troops and aviation routed the enemy surrounded to the south of Kishinev in the region of Yass. At the same time, Soviet troops on the outer front rapidly pushed south supported by aircraft and took over the large industrial region of Ploesti and Bucharest, the capital of Rumania.

On the evening of 23 August, the eve of the entry of Soviet troops into Bucharest, the combined workers' front of Rumania led by the Communist Party overthrew Antoneska's pro-fascist government. The people of Rumania, led by the communist, entered into battle against the Nazi troops in coordination with the Red Army.

Fliers from the Rumanian Air Force also took part in completing the rout of the enemy's "Southern Ukraine" army group and the complete liberation of Rumania. The First Rumanian Air Corps, operating in coordination with troops of the Second Ukrainian front, flew more than 2,500 combat missions and downed 100 Nazi aircraft in aerial combat near Bucharest and in Transylvania alone (from 24 August to 25 October 1944). It was in this struggle against a common hated enemy -- the Nazi invaders -- that the friendship between Soviet and Rumanian fliers was borne and developed.

On 8 September 1944, troops of the Third Ukrainian front supported by the 17th Air Army entered Bulgaria. Along with the Bulgarian people, who had risen under the leadership of the Communist Party, they quickly laid end to the Nazi invaders' occupation. /204

NAS

The Bulgarian Air Force also took part in the battle against Nazi Germany.

From September to November 1944 their pilots flew 4,400 combat missions and dealt the Nazi troops heavy losses in tanks, guns and personnel [245].

The Yass-Kishinev operation by the Red Army was distinguished by substantial success. Troops of the Second and Third Ukrainian fronts supported by the Fifth and 17th Air Armies and long-range aviation destroyed the main forces of the "Southern Ukraine" army group, and liberated Soviet Moldavia, Rumania and Bulgaria from the Nazi invaders. In 40 days of combat during this operation, the Air Force flew 20,781 missions [246].

Simultaneous with the development of a swift offensive in the central and southern sectors of the Soviet-German front, the Red Army, with active air support, dealt heavy damage to the enemy in the Baltic and, in the period from July through November, cleared almost the entire territory of the Baltic Republics of the invaders, as well as pushing the enemy out of the Soviet polar region.

To Berlin!

The year 1945 approached. The Soviet people entered it confident of a rapid and successful end to the Second World War. It was clear that the days of the Nazi invaders were numbered.

The war years had strengthened the steadfast political and morale unity of the Soviet people. The strength of the Soviet state had grown immeasurably.

By January of 1945, the number of aircraft pools in our field air units and commands had reached 16.5 thousand combat-ready aircraft [247]. The aircraft industry had improved production, and a steady flow of modern types of aircraft /205
was being delivered to our air armies. In 1944, the Yak-3 and La-7 fighters and the Il-10 assault aircraft were being incorporated as armament. They surpassed the enemy's comparable aircraft in speed, maneuverability, and armament.

The Soviet aviation had obtained new means of communication and a substantial number of radar stations. This helped to increase the steadiness and operability of our control of the combat operations of our air units and commands.

In 1944, there was a continuation in the improvement of the organizational makeup of the Air Force. In December, the long-range aviation was changed to the 18th Air Army and put under the command of the Air Force Commander. This facilitated a broader application of our long-range bombers for building up the strength of our front-line aviation. Along with this, the mobility and maneuverability of our long-range aviation also increased. The Soviet Command found it possible to rapidly concentrate a powerful strike force at any sector of the Soviet-German front. In addition, the organization of controlling the long-range bombers became simplified. The conditions for coordinating the long-range aviation with the air armies and ground troops at the front became easier.

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By this time, fascist Germany had entered a deep military and political crisis. Nevertheless, the Nazi army was still rather powerful, and it was crucial not to underestimate it. There were about 3,300 combat-ready aircraft in the active units of the enemy's Air Force, 2,000 of which were on the Soviet-German front [248].

The Nazi ring leaders saw that their way in extracating themselves from the situation lay in protracting the military operations and instigating differences between the countries of the anti-Nazi coalition, hoping to arrive at a separate accord with the Anglo-American ruling factions. The essence of the enemy's plan was based on the early preparation of an echelonment in depth, which would not permit Soviet forces to push further west.

The enemy's defense is especially strong in the direction of Berlin and in East Prussia, where a thick network of reinforced concrete defensive structures were echeloned in great depth.

The Soviet Supreme Command assigned our Armed Forces these sweeping objectives: simultaneously advance along the entire front to complete the defeat of Nazi Germany and hoast the Banner of Victory over Berlin. The main strike was directed toward Berlin. Having routed a large enemy grouping in /206
Poland and East Prussia, the Red Army had opened the way toward the lair of the Nazi beast -- Berlin.

The Red Army's winter campaign along a front from the Baltic Sea to the Danube -- unparalleled in terms of the scale and strength of the strikes -- began on 12-15 January 1945.

The Nazi strategists had calculated that the Vistula and the border fortifications in East Prussia would serve as a boundary beyond which the Red Army would not pass. However, even by the third day of our offensive the Nazis, unable to withstand the strikes by the Red Army, had begun hastily retreating along the entire front.

Bad weather conditions: fog, low cloud cover and snowfall -- confined our aviation to the ground and sharply curtailed its combat activity. During the first days of the offensive, only our Po-2 night bombers flew strikes against Nazi Headquarters and communication centers. Sometimes, the best assault and fighter crews would break through an almost blinding haze and carry out reconnaissance at hedge-hopping altitudes, while destroying enemy troop and equipment concentrations at the same time.

However, the weather gradually improved. The fog scattered and visibility rose. On the morning of 16 January, thousands of Soviet aircraft took to the air to aid our advancing troops.

Formations of the First White Russian and First Ukrainian fronts, which had been advancing in Poland, were carrying out the Vistula-Oder operation. They were supported and covered by 4,770 combat aircraft from the 16th and Second Air Armies. The enemy troops were covered and supported by up to half of the air units and commands of the Sixth Air Fleet, which numbered

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1,050 combat aircraft [249]. The remaining strength of this air fleet was operating in East Prussia.

In accordance with the tasks assigned by the commander of troops at our fronts, our aviation was to coordinate its operations with the combined-arms and tank armies to defeat the enemy, to prevent his reinforcing his behind-the-lines defensive borders during his retreat, and to prevent fresh enemy reserves from moving up to the battlefield from deep behind their lines. The fighters were entrusted with supplying dependable air cover for our tank troops and other front-line objectives.

The Air Force rapidly carried out these missions. The bombers operated against railroad centers and stations, and against bridges and river crossings, creating bottlenecks and destroying concentrations of troop and equipment echelons. Our assault aircraft harried enemy tank and motor vehicle columns /207
on both the highways and the back roads. As a rule, the strikes were made against the leading and trailing portions of columns as they passed through populated points, narrow defiles in roads, along corduroy roads, and over bridges, with the object that motion would be stopped, and the Nazi troops would be prevented from retreating. Making use of these operations by our Air Force, our forward ranks of tank formations would rapidly overtake the enemy, crush his columns, and capture echelons of troops and operable combat equipment.

On 16 January, Colonel A. V. Luk'yanov, commander of the 65th Tank Brigade, informed the commander of the 16th Air Army that five groups of assault aircraft numbering six planes each, flying against a retreating enemy column along the highway from Volyanuv to Mnishek, destroyed 12 tanks, four six-tube mortars, up to 200 trucks, and 120 vehicles. Approximately 200 enemy soldiers and officers had been killed. In his message, the tank brigade commander also commented on the skill and ability of the fliers from the Third Guard Assault Air Division. It was they who, taking off upon call from their commander Colonel A. A. Smirnov, hammered an enemy column observed by aerial reconnaissance.

Here is another example. Aerial reconnaissance had established that enemy echelons were moving across the Lodz' in unbroken columns, primarily from the regions of Warsaw and Sokhachev. The commander of the 16th Air Army ordered his 241th Bomber Air Division to stop the advance at that point. The division fliers, headed by Colonel A. G. Fedorov, successfully carried out their combat mission. They destroyed railroad lines and approaches and exits, and put the railroad center almost entirely out of commission. Our tankmen, who rapidly captured Lodz', seized 400 railroad cars loaded with equipment and supplies, and 28 useable engines [250].

On the same day, fliers from the Third Bomber Air Corps (commander: General A. Z. Karavatskiy) carried out an unusual assignment. Remnants of the enemy's grouping at Warsaw was retreating to the northwest in disorder under strikes from the Red Army. In the region of Vyshegrud, the enemy had begun crossing the Vistula on the ice. The commander of troops of the First White Russian front ordered the Third Bomber Air Corps to break up the ice along the sector near Vul'ka Pshibovs'ka to Vyshegrud for a distance of 20

kilometers and break up the crossing. By their strikes, the bomber pilots broke the ice up to the extent that it was not even useable to get troops across [251].

The assault pilots operated against railroad objectives and enemy columns /208
no less successfully than did the bomber pilots. On 18 January, 19 Il-2 aircraft from the 70th Guard Assault Air Wing headed by wing commander Lieutenant Colonel A. I. Kuz'min flew a strike against the railroad stations at Andzheyuv and Galkuvek. With precise bombing and cannon fire, they destroyed four enemy echelons. One of these was carrying ammunition, and the others had dismantled aircraft, tanks and other equipment. After the raid by our assault fliers, fires and explosions from ammunition continued for about a day. As many as 30 enemy echelons piled up in front of the station, prizes for our tankmen [252].

With the active support of our aviation, Soviet ground troops pushed rapidly forward. On 16 January alone, the Second Guard Tank Army fought its way 75 kilometers and seized the town of Sokhachev with an assault, cutting off all means of retreating for the enemy's Warsaw grouping. In the region of Sokhachec, our tankmen captured a useable enemy airfield to which our fighters, and then assault aircraft, were immediately transferred.

On 17 January, an encircling maneuver by Soviet troops and units of the First Army gave them possession of Warsaw. The Fourth Polish Combined Air Division, commanded by Colonel A. S. Romeyko, coordinated its efforts with the Soviet Air Force in supporting ground troops during the assault of Warsaw. For their brave actions, the Polish fliers received the thanks of the Supreme Command of the Soviet Armed Forces [253].

The enemy Air Force proved incapable of carrying out active combat operations under bad weather conditions. However, as soon as the weather improved enemy fighters put up serious resistance against our crews, while their bombers attempted to fly strikes against the advancing Soviet troops. However, the Soviet fighters gave our troops reliable cover and maintained freedom of operation for our aircraft. Frequently there were fierce battles in the air. On 16 January, the renowned aerial sniper Major I. N. Kozhedub, twice a Hero of the Soviet Union, engaged 12 enemy fighters as he finished a tour of free-lancing. With a swift attack he downed one of the enemy aircraft [254]. During that day, our fighters downed a total of 18 Nazi aircraft [255].

As the Soviet troops advanced westward, it became all the more difficult for our aviation to function: the weather deteriorated, and there were too few /209
airfields. The retreating Nazis had blown up the hard-surface runways and made them useless. The suddenly approaching thaw following heavy snowfall had caused great slush. The combat airfields were useless. When our tank armies and later our combined-troops armies reached the Oder, our Air Force was 200 to 400 kilometers behind them. In addition, the enemy had located substantial numbers of airfields with well-maintained runways around the Berlin air center.

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The Nazi Air Force, taking advantage of these favorable conditions, sharply

increased its activity. During the first ten days in February alone, they flew approximately 14,000 missions along the sector of the First White Russian front. At the same time the 16th Air Army flew a total of only 624 combat missions with the objective of repulsing enemy Air Force raids. Directing his main Air Force strength toward achieving air supremacy and flying strikes against our tank units, the enemy attempted to prevent the forcing of the Oder and the broadening of the Soviet troops' beachhead. The enemy Air Force flew up to two to three thousand missions every day.

Representatives of the Soviet and Bulgarian Air Forces during a Briefing before a Combat Mission.

The Soviet Command had to take immediate and decisive steps to supply airfields for our aviation, to win back the initiative in the air which we had lost, and drive enemy aircraft from the battlefield. This task was performed differently in each air army. Thus, in the Second Air Army the Breslau-Berlin Highway was used as a fighter airfield. Along the dirt strip between the concrete roadways, trees were uprooted and all unevenness and pot-holes were smoothed over. The first test of this unusual airfield was carried out by Colonel A. I. Pokryshkin, commander of the Ninth Guard Fighter Air Division and triple Hero of the Soviet Union; by that very evening, his entire division was based on the highway. In several days, the 22nd Guard Fighter Air Division commanded by Lieutenant Colonel L. I. Goreglyad was making landings on the highway.

Our ground troops and the Polish populace were of great help in making airfields for the wings of the 16th Air Army. Upon orders from the commander of the First White Russian front, each combined-arms army constructed one airfield in its sector. Special metal plates and bricks from bombed-out buildings were used to surface the runways.

Air Force Colonel-General V. A. Sudets, Commander of the 17th Air Army, at his Command Point.

Soviet Fighters over the Reichstag.

The first unit to be transferred to these newly constructed airfields was the Third Fighter Air Corps, which immediately went into fierce combat with the enemy Air Force. Through their bold and decisive actions, the Soviet fighters crushed the enemy's resistance. The Nazi Air Force, having lost 396 aircraft, was forced to sharply curtail its activity. Whereas during /210 the second ten days in February they had flown more than 3,000 missions,

during the last third of the month they flew only 670. During this time, our 16th Air Army alone flew over 10,000 missions. Soviet ground troops as well as bomber and assault aircraft had again achieved freedom of operation.

Pilots from the 176th Guard Fighter Air Wing Congratulate I. N. Kozhedub (first from the left) on his 60th Victory.

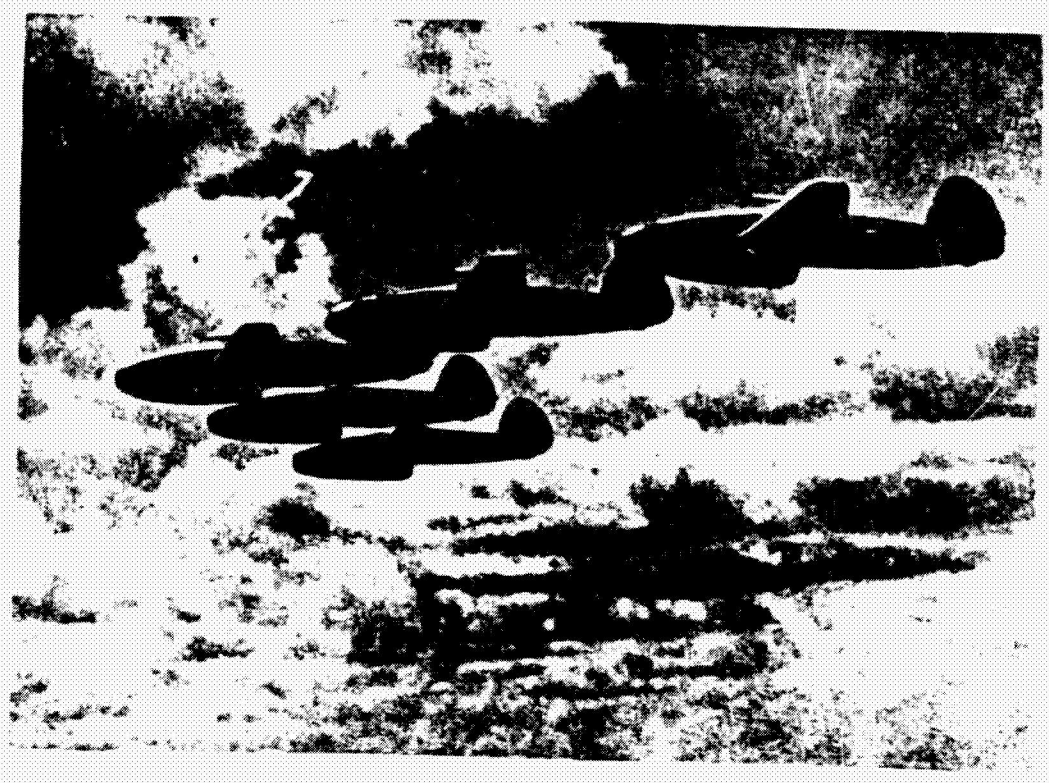
The Vistula-Oder operation brought the Red Army still another glorious victory. Our tankmen and infantrymen, actively supported by our Air Force, completely routed a large grouping of Nazi troops in Poland, fought their way 570 kilometers, and seized the eastern regions of Germany and forced the Oder. The enemy had lost his vast Silesian coal and metal base. Soviet troops were 60 kilometers from Berlin, capital of the fascist Reich. Covering and supporting ground troops, fliers from the 16th and Second Air Armies flew more than 54,000 missions and in 1,150 aerial encounters downed 908 enemy aircraft [256].

At the same time as the defeat of the Nazis in Poland, troops of the Second and Third White Russian fronts successfully advanced into East Prussia. The Fourth and First Air Armies, which had more than 3,000 aircraft, were the first to operate along these fronts. In addition, there were also units from the 18th Long-Range Air Army.

With precise strikes, our Air Force destroyed permanent defensive fortifications and wiped out counterattacking enemy tanks.

On 14 January, two regiments of enemy infantry supported by 130 tanks countered-attacked the troops of the Fifth Army. Fierce battles ensued. Assault planes from our Fitst Guard and 277th Assault Air Division to the aid of our ingantry units. Although the weather made flying almost impossible, the Soviet pilots flew 257 missions. After strikes by our assault aircraft, as many as two dozen burning enemy tanks were left on the battlefield. The weakened enemy's counterattack was successfully repulsed by our infantry.

Our bombers destroyed permanent fortifications along the enemy's second and third lines of defense with 250-500 kg demolition bombs. As a result, our tankmen moved rapidly through the enemy's heavy defense and rolled out on a broad offensive across the enemy territory.



The First Yak-15 Jet Aircraft in Flight.

The Fighter Pilots Who, in 1948, First Carried Out a Group Flight in Jet Aircraft (left to right): N. I. Khramov, P. S. Sereda, Ye. Ya. Savitskiy, V. V. Yefremov and P. G. Solov'yev.

On 26 January, the Fifth Guard Tank Army reached the shores of the Baltic Sea. The enemy's East Prussian grouping had been isolated from the main forces. The isolated enemy troops installed themselves in fortified regions and put up stubborn resistance. The enemy maintained an especially fierce

defense of Königsberg -- a fortified town which was the capital of East Prussia and a major maritime port. /211

L. I. Brezhnev with Fliers Being Awarded the Rank of Hero of the Soviet Union, as well as Test Pilots and Navigators Being Presented Awards and Certificates by the Presidium of the Supreme Soviet of the USSR in Recognition of Their Being Awarded the Honorary Ranks of "Honored Test Pilot of the USSR" and "Honored Test Navigator of the USSR." In the photo (left to right in first row): G. K. Mosolov. L. I. Brezhnev, V. S. Ilyushin, V. F. Kovalev and D. V. Trublakov; in the second row: Ya. I. Vernikov, A. P. Yakimov, I. M. Sukhomlin, P. S. Sheronov and I. S. Sharuyev, 1961.

Extremely bad weather conditions made it impossible for the Air Force to carry out preliminary prepping for the assault of Königsberg. Instead of our anticipated 5,316 missions intended to destroy the enemy's defensive fortifications, we flew only 766. During the assault, the power of our air strikes steadily increased and reached colossal extents. On 7-8 April alone, 1,118 medium and heavy bombers took part in mass strikes.

The assault of the fortress city of Königsberg lasted four days. Unable to repulse the devastating strikes from the air and ground, the enemy was forced to capitulate on 10 April. During the battle for Königsberg, our Air Force flew 14,000 missions and dropped 4,500 tons of bombs on the enemy [257].

In his memoirs, the commandant of Königsberg, Nazi General O. Lasch wrote: "Bombers and assault aircraft flew in wave after wave, dropping their

destructive load over the blazing city... Antiaircraft batteries were powerless against such masses of aircraft..."[258].

In commemoration of the victory we had won, the Presidium of the Supreme Soviet of the USSR authorized a special medal "For the capture of Königsberg." This medal was awarded all fighting men who had taken part in the assaults on the city, including the aviators.

The defeat of the enemy's East Prussia grouping sharply weakened the defensive strength of Nazi Germany. They permanently lost an advantageous beachhead for operations against the Soviet Union. The Soviet Air Force flew more than 145,000 missions during this operation.

The homeland paid high tribute to the feats achieved by the valiant Soviet aviators. By decree from the Presidium of the Supreme Soviet of the USSR, a second Gold Star was awarded to the commander of the First Air Army General T. T. Khryukin, Majors V. A. Aleksenko, L. I. Beda, I. A. Vorol'yev M. G. Gareyev, Akhmet-Khan Sultan and M. P. Odintsov; Captains A. Ya. Brandys and P. Ya. Golovachev; and First Lieutenant A. K. Nedbaylo. Many of our airmen were awarded orders and medals of the Soviet Union.

The Soviet Air Force was equally active in the southern sector of the Soviet-German front during the Red Army's liberation of Hungary, Austria, and Yugoslavia. Fliers from the Fifth and 17th Air Armies aided the infantry and tankmen in breaching the enemy's defense, destroying river crossings, making strikes against railroad stations and echelons carrying equipment and personnel, putting airfields out of commission, and engaging the German Air Force in combat in the air. /212

The Air Force's combat activity in repulsing powerful enemy tank strikes near Lake Balaton was quite important. Here in early March 1945, the enemy attempted a counteroffensive. He hoped to repulse Soviet forces beyond the Danube, capture Hungary's oil sources, and block the Red Army's path into Austria. To carry out this intention, the enemy allocated 31 divisions, more than 11 of which were tank divisions. The enemy's main strength was his Sixth Tank Army, which had been transferred from the western front. It was supported by 850 aircraft from the Fourth Air Fleet [259].

On the night of 6 March, the enemy's Sixth Tank Army made a strike on the sector between Lakes Velentse and Balaton. The enemy broke through to the Danube, attempting to cut off the troops of the Third Ukrainian front. The avalanche of enemy tanks encountered withering fire from the Soviet artillery and precise air strikes.

Comprehending the enemy's intentions, the Soviet Command ordered the troops of the Third Ukrainian front, without a break in their preparations for the offensive against Vienna, to wage a defensive operation during which a grouping of enemy tanks was destroyed in the region of Lake Balaton.

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This mission was successfully carried out by combined strikes of infantry troops and aviation.

All the forces of the 17th Air Army and -- during the most difficult days -- a large portion of the commands from the Fifth Air Army, were thrown into supporting and covering our troops on the defensive. Assault aircraft and bombers flew strikes against the enemy tanks on the battlefield, and destroyed them at their concentration points and at the boundaries where they deployed for the attack.

On 11 March, aerial reconnaissance observed up to 80 enemy tanks in the region of Sheregel'esh. Thirteen groups of 8-12 Il-2's each from the Seventh Guard Assault Air Division, commanded by Colonel G. P. Shuteyev, took off to destroy this tank grouping.

The attack by the Soviet fliers caught them unprepared. Several enemy tanks were destroyed during the first runs. The others were found hunting for cover. But our precisely dropped bombs and accurate fire overtook the enemy everywhere. As a result of this operation, the enemy suffered serious losses, his tank grouping was scattered, and the attacks were broken off.

On 12 March, at the height of the defensive battles near Varpalota, the /213
enemy pulled several dozen medium and heavy tanks from his reserves and put them into battle. Exhausted by constant battle and the losses they had suffered, the Soviet artillerymen and infantrymen were in dire straits. The result was an immediate threat that the enemy might break through deep into our defenses.

The outcome of this battle was decided by our assault aircraft. Upon orders from the commander of the 17th Air Army, 40 assault aircraft were sent to destroy the enemy tanks. For more than an hour they carried out continuous attacks against the enemy. Nineteen burning tanks, five guns, and 27 trucks littered the battlefield [260]. Remaining tanks turned and fled. The enemy's attack had been repulsed.

In the Balaton defensive operation, our infantry troops and aviation, acting in close coordination, had in a short time destroyed a large enemy tank grouping. For the Red Army, this was the last defensive operation. From that time on until the end of the war, the enemy would never again undertake a major offensive operation.

During the defense at Lake Balaton, the Soviet Air Force emerged as one of the major forces in routing the advancing enemy. In nine days of battle, the 17th Air Army alone flew 5,877 missions, as a result of which approximately 90 tanks, 43 armored transports, 540 trucks and much other combat equipment and substantial numbers of enemy troops were destroyed [261].

After the Balaton defensive operation, the 17th and Fifth Air Armies engaged in active combat operations in the direction of Vienna and toward Yugoslavia. The Air Force proved to be a great aid to the troops of the Second and Third Ukrainian fronts as well as the Bulgarian and Yugoslavian armies in wrapping up the liberation of the Balkan countries from the Nazi invaders, and in crushing the Nazis in Austria and seizing its capital, Vienna.

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In Yugoslavia, the Soviet air group under the command of General A. N. Vitruk carried out active co.bat operation and, at the same time, trained Yugoslavian flight crews. This group, consisting of the Tenth Guard Assault and 236th Fighter Air Divisions, were under the command of the People's Liberation Army of Yugoslavia from early October 1944 to the end of the war. They participated in all operations carried out by the Yugoslavian army, including the liberation of Belgrad.

For successfully carrying out their combat missions, the Presidium of the Anti-Fascist Vetche (Popular Assembly) of the People's Liberation of Yugoslavia awarded the commander of the Soviet Air Group, Hero of the Soviet Union General A. N. Vitruk, the rank of People's Hero of Yugoslavia. This same high honor was awarded to First Lieutenants I. A. Bulkin and P. I. Dmitriyenko, Captains I. N. Konstantinov and B. T. Kalinkin, First Lieutenants A. G. Monogadze and V. A. Ulisko, and Majors A. S. Shornikov and P. Ya. Yakimov. Many of our aviators were awarded Yugoslavian decorations. The commander and fighting men of the First Yugoslavian Army presented General Vitruk with a letter which said, partially: "To you, comrade General, and to your brave fliers who tirelessly dealt blows against the enemy and assisted the combat operations of our divisions, we extend our friendly and brotherly greeting and express our gratitude in the name of all the fighting men, officers, and political workers of the First People's Liberation Army of Yugoslavia" [262]. /214

The Yugoslav fliers, equipped with Soviet aircraft and trained by flight and support crews from the Soviet Union, fought selflessly along side the Soviet fliers. They flew approximately 1,400 combat missions[263] and inflicted substantial losses to the enemy in terms of tanks, guns, and trucks, during the liberation of their homeland from January 1945 to the end of the war.

In the spring of 1945, the Red Army unleashed violent fighting to finish its defeat of the Nazi Armed Forces and seize Berlin.

The enemy had created a powerful defensive system around Berlin. It was here that the Oder-Niesen defensive boundaries and the Berlin fortified region had been set up. The depth of defense reached 100 kilometers. Selected troops from the two army groups, the "Vistula" and "Center", had been concentrated for the defense of Berlin. The enemy's Air Force numbered approximately 2,000 aircraft, including the Sixth Air Fleet and the "Reich" Air Fleet [264].

Carrying out the Berlin operation fell to the troops of the First and Second White Russian and First Ukrainian fronts. The grouping of our Air Force included the 16th, Fourth and Second front-line air armies and the 18th long-range air army. In addition, the Polish Air Force, tactically under the command of the 16th Air Army, was carrying out combat operations along the sector of the First White Russian front. Our aviation totalled 7.5 thousand combat aircraft.

The Berlin operation began on 16 April 1945. On the eve of the beginning of the combat operations, unfurled military banners were proudly displayed at the beginnings of the airfield runways in our air units. The aviators /215

swore to carry out to the end their vow to their homeland -- to deal the death blow to the fascist beast in his own lair.

The troops of the First White Russian front launched their offensive two hours before dawn. Aerial prepping was carried out by 209 Po-2's which had been flying strikes all night against enemy troops, command points, and communication centers deep behind the enemy's lines.

The 18th Long-Range Air Army gave aerial support to the troops before dawn. A massed strike of 743 long-range bombers was carried out against main strong points on the enemy's second line of defense. The raid lasted 42 minutes, during each of which 22 tons of high-caliber bombs were dropped on the enemy.

Experienced fliers who had gone through the severe school of the war followed in the combat formations of the long-range Air Force units. These fliers included double Heroes of the Soviet Union A. I. Molodchiy and V. N. Osipov, who had already flown strikes against the capital of Nazi Germany.

According to observations from control groups headed by the commanders of air corps and divisions, the massed strike was highly effective. The most vital of the enemy's strong points had been destroyed. Dozens of heavy explosions had occurred. The fire from enemy artillery had slackened.

With the coming of dawn, the 16th Air Army entered the battle. The morning fog prevented carrying out the massed strike called for in the plan. The pilots of the assault aircraft flew in small groups, damaging and destroying enemy fire points and troops on the battlefield. The commander of the 80th Infantry Corps of the Fifth Main Attack Army, General V. A. Verzhbitskiy, in evaluating the operation of the 198th Assault Air Division (commander: Colonel V. I. Belousov) in breaching the enemy's tactical defenses, wrote: "The 198th Assault Air Division played a vital role in helping our infantry units achieve success. The assault pilots cleared the way for the infantry, destroying and damaging the enemy's fire points and artillery."

Bomber air units from the 16th Air Army, supporting the advancing troops, attacked and destroyed strong points on the second and third lines of defense, as well as flying strikes against highway and railroad centers to make it more difficult for enemy reserves to be brought up to the battlefield.

The 16th Air Army's fighters successfully carried out their mission of covering the troops and rear-area objectives. During the first five days of the operation, the fighter pilots fought 599 aerial battles and downed 564 enemy aircraft, while maintaining strict air supremacy [265]. /216

The troops of the First Ukrainian front launched their offensive on the morning of 16 April. Aiding in forcing the Niesse River and breaching the enemy's first line of defense, the air army carried out a massed strike in which 688 aircraft took part. During the beginning of this strike, 208 dive bombers carried out aerial prepping. The Soviet fliers destroyed major strong points in the enemy's defenses at Forst, Koine and Muchow.

The Crew of an Assault Aircraft Report Carrying Out Their Combat Mission to Colonel V. I. Belousov, Commander of the 197th Assault Air Division.

With active air support, the ground troops rapidly forced the Niesse and began advancing deep into the enemy's defenses. Large groups of assault aircraft flew powerful strikes against the enemy's fire points and troops.

The enemy put up stubborn resistance and undertook fierce counterattacks. He halted the advance of troops in the Third and Fifth Guard Armies through heavy artillery raids and counterattacks. Upon orders from General S. A. Krasovskiy, commander of the air army, the Air Force flew aid to the Soviet troops. One hundred and ten aircraft from the Second Guard Assault Corps (commander: General S. V. Slyusarev) flew a precise strike against enemy fire points and counterattacking tanks in the region of Forst and Gross-Tshchaksdorf./217 At the same time, 100 aircraft from the First Guard Assault Air Corps struck the enemy near Köbeln, Emlitz, and Muchow.

Actions by our assault aircraft silenced enemy artillery fire and defeated a tank counterattack. After air strikes, troops of the Third and Fifth Guard Armies in a dash occupied three enemy trenches and secured the strong points of Gross-Tshchaksdorf, Köbeln and Emlitz. Right behind these, the major defensive points of Forst and Mochow were cleared of the enemy.

After our tank army entered the struggle, 75% of all the strength of the air army was given to supporting men. The tank units acting in coordinated efforts with the Air Force repulsed counterattacks by enemy reserves, forced the Spree River at a rush, broke through the enemy's third line of defense, and began rapidly approached Berlin.

Troops of the Second White Russian front launched their offensive on the morning of 20 April. With substantial Air Force aid, they rapidly forced the Oder and began forcing the enemy's defenses. The Nazi Command had no ability to strengthen the defenses of Berlin because of the necessity of shifting troops from the north.

On 21 April, units of the First White Russian and First Ukrainian fronts supported by the 16th, Second, and 18th Air Armies, began the fierce battle of Berlin. From the very first days of battle for the city, our front-line and long-range aviation, operating in large groups, attempted to disrupt the functioning of the Nazi German governmental organs, disorganize control of the Armed Forces, destroy main defensive fortifications, inflict losses on the defenders, and deprive them of any means of resisting.

On the night of 21 April, 529 heavy bombers from the 18th Air Army and 184 night bombers from the 16th Air Army flew a strike against Nazi defenses, troops, and equipment on the eastern and northeastern outskirts of Berlin. On 24 April, 205 aircraft from the Second Air Army flew a raid against enemy troops and fire points in the southern sectors of the city. But the especially powerful strike by our bombers took place on the night and day of 25 April. During the night, 111 heavy aircraft from the 18th Air Army went into operation, and during the day, in accordance with the plan given the code-name "Salute", the 16th Air Army flew two massed strikes in which 1,486 aircraft participated [266]. During the night of 26 April, 563 bombers from the 18th Air Army made another raid.

The Nazi troops defending Berlin were subjected to continuous action by the Soviet Air Force for a long period of time. They suffered heavy losses in both troops and equipment. Our fliers destroyed many defensive structures. /218

"I can only say that we sat in the underground levels of the imperial Chancery incapable of getting a glimpse of daylight" [267]. This is the way General Bauer, the captured commander of the Government Air Squadron and Hitler's chief pilot, characterized the crushing strength of strikes by the Soviet Air Force. "I feel," -- stated captured Nazi Lieutenant Colonel Otto, -- "that the Russian Air Force did a good job in handling their mission of supporting ground troops during the operation for taking Berlin. Every bomb dropped knocked a definite section out of operation, not only by its destructive force, but in terms of morale as well" [268].

Nevertheless, the enemy put up fierce resistance to the advancing Soviet troops. Fierce battles broke out in every block, street, and building. When the assault on the center sections of Berlin began, our Air Force switched to echeloned operations in small groups. This was necessitated by difficult conditions on the ground. The smoke and dust raised by the continuous explosion of aerial bombs and shells and the sea of fires cut down visibility substantially. It was difficult to distinguish the position of troops from the air. Therefore, it proved best to use small units and individual crews of dive-bomber snipers. Our assault aircraft were forced by the low visibility to fly dummy attacks without dropping bombs or firing. Such attacks forced the enemy to stop firing and seek cover, which made it easier for our ground troops to advance.

Fierce dogfights were fought over Berlin. Seven fighters from the 265th Fighter Division boldly engaged 50 enemy aircraft attempting to fly a strike

against our troops. Lieutenant N. Yu. Brodskiy rushed into the ranks of the Nazi aircraft and downed one of them. He was attacked by six fighters. With a deft maneuver he sought cover in clouds and then, appearing unawares, downed still another aircraft. During this battle the Nazis lost a total of four aircraft.

Fighters from the Polish Air Force fought in conjunction with Soviet fighters. During the operation, they downed 16 enemy aircraft in aerial combat [269].

On 30 May, the heavy fighting for the Reichstag began. Early on the morning of 1 May, our Victory Banner was unfurled over the Reichstag building. /219

During the international holiday of May Day, fliers from the Second Air Army flew an unusual flight over Berlin. These guard fighters had prepared two red panels. On one was written "Victory", and on the other side was "Glory to the Soviet fighting men who unfurled the Victory Banner over Berlin", and on the other was "Long live May Day!". At noon, guard captain K. V. Novoselov, flight commander of the 115th Guard Fighter Wing, and Major I. A. Malinovskiy, commander of the First Guard Fighter Wing, flew their planes over the Reichstag accompanied by double Hero of the Soviet Union A. V. Vorozheykin, Heroes of the Soviet Union V. N. Buyanov, I. P. Laveykin, P. I. Peskov, and others of our most renowned fliers. Red Banners were parachuted from these aircraft. Unfurling in the smokey Berlin sky, the banners slowly dropped to the position held by Soviet troops, symbolizing the complete victory of Soviet Armed Forces on the ground and in the air.

With the fall of Berlin, Nazi Germany was forced to capitulate. On 8 May, at Karlshorst, a suburb of Berlin, representatives of the Nazi German Command signed the document of unconditional surrender.

During the battle of Berlin, the Soviet Air Force had demonstrated its invincible power, while our fliers had shown their high combat skill. The Communist Party and Soviet government paid high tribute to the combat achievements of our air armies. Forty five air units and commands were awarded the honorary names Berlin and Brandenberg.

All participants in the operation were awarded the medal "Za vzyatiye Berlina (for the capture of Berlin)", authorized in honor of this historic victory. Thousands of fliers, navigators, gunners, and technicians received decorations and medals. Those who had been most outstanding in the battles were awarded the high rank of Hero of the Soviet Union, and Captains V. I. Andrianov, G. F. Sivkov, and N. G. Stolyarov, First Lieutenant T. Ya. Begel'dinov and Lieutenant I. Kh. Mikhaylichenko received their second "Gold Stars." In August 1945, Major I. N. Kozhedub, who had taken part in the Berlin operation, was awarded his third Gold Star as Hero of the Soviet Union.

During the days when fierce battles were going on in the Berlin area to defeat the main forces of Nazi Germany, the Red Army had begun its last engagement against the Nazi invaders -- the Prague offensive operation.

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Toward the end of the war, large numbers of Nazi troops and aviation had been concentrated in Czechoslovakia, primarily from the "Center" army group under the command of Field Marshal General F. Scherner, and the "Austria" army groups headed by Nazi General L. Renduliech. After the fall of Berlin, this grouping's situation was hopeless. Nevertheless, Scherner and Renduliech, in agreement with Hitler's successor Gross-Admiral Doenitz, refused to surrender. They demanded that their troops put up stubborn resistance against the Soviet troops, planning to reach an agreement and surrender to the Americans. /220

On 5 May, a revolt broke out against the Nazi invaders. Revolts also broke out in Yuzhnaya Chekhiya and other sections of the country. The Nazi Command had to use substantial portions of their troops against the revolt by the people. Fierce barracade battles broke out between the insurrectionists and the overwhelming enemy forces. Immediate aid was required from the Red Army to the friendly Czechoslovakian people.

In the resultant situation, Soviet troops finished their preparation for the operation ahead of time and with all out strikes in the general direction of Prague, in six days they surrounded, captured and destroyed the enemy grouping in Czechoslovakia.

Our tank armies, actively supported by aviation, played an important role in this operation. Our tankmen drove deep and fast behind the enemy lines and cut off communication between the main enemy grouping and its path of retreat to the west.

In assisting the combat operation by our tank armies, our assault fliers and bombers destroyed enemy main points, damaged and destroyed fire points and troops on the battlefield, and prevented maneuvers and retreat by enemy troops to the west.

At the same time, troops of the Fourth and Second Ukrainian fronts, including the Eighth and Fifth Air Armies, were rapidly approaching Prague from the east and southeast.

The enemy's Air Force showed weakened activity. A significant lack of fuel and a general disorganization of command were apparent. This made it possible for part of fighter wings to devote their actions toward destroying ground targets. Our assault fliers and fighters almost completely paralyzed movement along the roads.

Moving rapidly forward, the tank armies of the First Ukrainian front reached Prague on the night of 9 May. Along with the Czechoslovakian surgeons, the Soviet troops had completely cleared the city of Nazis by 1000 hours in the morning. In a few days, all of Czechoslovakia had been liberated. During the Prague operation, the fliers from the Second Air Army alone flew more than 5,000 combat missions [270]. /221

NASA

In the Far East

Three months after the fall of Nazi Germany, the Red Army dealt a crushing blow to imperialist Japan with the objective of quenching the fires of war in the Far East.

Groups participating in the operations aimed at destroying the Japanese Kwantung army were the Ninth, Tenth, and 12th Air Armies (commanders: Air Force Marshal S. A. Khudyakov and Generals I. M. Sokolov and P. F. Zhigarev), as well as the Air Force from the Pacific Fleet (commander: General P. N. Lemeshko) and the northern Pacific flotilla. In the Far East, Soviet fliers had to operate under unique climatic conditions over boundless expanses of wooded mountain terrain, deserts and semi-desert. All of this created substantial difficulties for carrying out combat missions and demanded high skill, persistence, and initiative on the part of the flight crews.

Combat activities in the Far East began on the night of 9 August 1945. At midnight, 76 aircraft from the 19th Bomber Corps (corps commander: General N. A. Volkov) took off to strike at the enemy's major military objective in Manchuria -- the cities of Chanchun, and Harbin. Only half of the crews managed to break through the almost solid wall of cloud, fog and rain and attack the prescribed objectives. These strikes were a vital factor in disrupting the morale of the troops and populace, and were a cause of concern in the headquarters of the Kwantung army.

On the morning of 9 August and in the following days, the main efforts of the front-line Air Force were directed toward disrupting operational movements by the enemy. Regions of combat operations of the main front-line groupings had to isolated from the influx of enemy reserves from the rear, and the maneuvers and retreat of enemy troops had to be prevented so that they would be left under the attack of advancing Soviet units.

The Air Force showed itself bravely in carrying out this mission. In good weather and bad, bombers, assault planes and even fighters in large and small groups flew strikes against railroad centers and stations and enemy troop and equipment columns on the highways and the back roads. The North /222
Korean ports of Yuki, Rashin, and Seishin as well as transports at sea were attacked from the air.

Operations by our Air Force almost completely paralyzed movements along railroads, highways and even the major dirt roads in Manchuria and North Korea. Pilots of the Ninth and 12th Air Armies alone destroyed 70 railroad engines, 30 echelons with troops and supplies, more than 700 trucks and several armored trains and many other railroad objectives.

The disruption of ground and sea communications resulted in the isolation of the main groupings of the Kwantung army and loss of communication of the mother country from Manchuria. Enemy reserves thus remained in concentration with no way of moving forward or occupying favorable boundaries for defense. The mountain passes and main road networks through the Greater and Lesser Khingan Mountain Ranges were left open for the Red Army. The Japanese Command

could not use such important links as Hailaerh (Hailar) -- Harbin (Haerhpin), Khalun -- Arshan -- Ch'ongjin or others for withdrawing troops or needed supplies. The operations of the Soviet Air Force against the enemy's communications in the Far East had a great effect on the progress and outcome of the entire campaign.

Ground troops supported by air made major advances in night battles on 9 August and succeeding days. Tank units advanced up to 140 kilometers per day. Centers of resistance and fortified areas in the path of the advancing Soviet troops were safely put out of commission and destroyed by powerful air strikes.

With the high rate of advance and the limited number of airfields, bombers with a substantial radius of action had to be brought up to support our ground troops. It became their job to lay the way for our tankmen and infantrymen.

On 10 August, troops of the 35th Army reached the Khutouskiy fortified region. Using permanent reinforced concrete defensive fortifications, the enemy put up stubborn resistance. A swamp prevented our outflanking this center of enemy resistance. He had to be taken in head-on bloody battle. The Air Force came to the aid of the Soviet ground troops at this difficult moment.

Our fliers justified the faith in them. Groups from the 34th Bomber Division commanded by Colonel K. A. Mikhaylov took to the air. The enemy immediately opened antiaircraft fire against the advancing aircraft. One after the other, the aircraft advanced and dropped their deadly load on the enemy. They zeroed in accurately on a given point. The bombs were dropped from an altitude of 900-2,000 meters.

The results of this Air Force operation were substantial: the enemy troops suffered serious losses, and the defensive structures were blown apart. Panic overtook the entire garrison of the fortified region. The Soviet troops moved forward almost without losses and in two hours had seized one of the major enemy centers of resistance. The commander of the 34th Bomber Air Division reported to the commander of the Ninth Air Army: "Mission accomplished, all aircraft returned to their airfields." /223

During the combat operations in the Far East, Soviet aviators repeatedly demonstrated heroism, intelligent initiative, resourcefulness, and selfless mutual assistance in combat.

On 11 August, Major S. A. Chernykh, commander of the 75th Assault Air Wing, was out free-lancing with his flight commander Lieutenant Yurchenko. On one stretch of the line between the Mulingchan and Hsiach'entz'u stations, they attacked a Japanese armored train. On their third pass, enemy antiaircraft fire damaged the leader's plane. Major Chernykh made a forced landing not far from the railroad's permanent way, on enemy territory.

NASA

Lieutenant Yurchenko, without a moment's thought, courageously went to his commander's aid. He skillfully put his aircraft down next to Major

Chernykh, got him on board, and made a safe return to his airfield [271].

Our fighters maintained uninterrupted air supremacy. The enemy's main airfields were blockaded, and there were almost no enemy aircraft to be seen in the sky.

In the Manchurian taiga regions as well as in the desert and semi-desert terrain of Inner Mongolia, transport aircraft supporting the troops with materiel supplied tank units with fuel, ammunition, rations and water. For just the Sixth Guard Tank Army of the Baikal front, transport aircraft of the 12th Air Army flew 1,635 missions and carried 2,072 tons of fuel and 186 tons of ammunition [272]. Our tankmen expressed their warm thanks to the fliers for the help given them during these difficult times.

The defeated enemy attempted to withdraw his troops and necessary equipment to Japan. The Soviet front-line, long-range, and naval aviation thwarted this enemy intention. They dealt effective strikes against ships and transports both at sea and in port.

On 17 August, the Japanese emperor radioed his surrender. The Soviet /224
Command made use of many airborne landings in order to most quickly disarm the troops of the Kwantung army and eliminate the last centers of resistance. Airborne landings were carried out at the airfields at Kirin (Chilin), Ch'angch'uan, Mukden, Kharbin, and other towns in Manchuria and North Korea. The largest airborne landing, with over 500 men taking part, took place at Kharbin. The airborne troops quickly disarmed the troops of the Kharbin garrison and occupied the city.

On 2 September 1945 imperial Japan signed an act of unconditional surrender.

By their combat operations in the Far East, the Soviet Air Force had written another proud page in the chronicals of the Soviet people's struggle against imperialist aggressors.

The crushing blows dealt by Soviet troops and aviation in 1944-1945 had brought Nazi Germany and Japan's Kwantung army to utter defeat.

The Air Force's combat activity during these years was characterized by its broad scope. Four to eight and a half thousand aircraft took part in the mopping-up operations in the major sectors. This bears witness to the tremendous growth of the military might of our socialist nation, and of the Party and government's great concern over the development of aviation.

Results of the Military Activities of Soviet Aviation during World War II

World War II in the Soviet Union ended with an epoch-making victory for our nation. Under the guidance of the Communist Party, the heroic Soviet people and its Armed Forces defeated Nazi Germany and its satellites in prolonged and fierce combat, vindicated the freedom and independence of our socialist state, liberated the countries of eastern and central Europe from

NASA

Nazi oppression, and lent invaluable aid to the peoples of Asia in their struggle against the Japanese invaders.

Our Air Force made a great contribution toward this victory over the enemy. In the hands of the Soviet Command, it proved to be a powerful and the most mobile branch of our Armed Forces, a major contributing factor not only toward the course and outcome of operations, but the war as a whole.

During World War II, the Soviet Air Force flew approximately 4 million missions. Our fliers hit the enemy with more than 30 million bombs with an overall weight of approximately 700,000 tons, and inflicted heavy losses in both personnel and equipment.

In his order dated 19 August 1945 I. V. Stalin, commander in chief of the Armed Forces, noted: "During the Soviet people's Great Patriotic War, our Air Force fulfilled its debt to the homeland honorably. The brave eagles of our fatherland routed the vaunted German Air Force in fierce aerial combat... Along with the entire Red Army, it dealt crushing blows against the enemy, destroying both his personnel and equipment. The skillful actions of our valiant Air Force were a constant aid to success by the ground troops, and helped bring about the enemy's utter defeat" [273]. /225

The primary task of the Soviet Air Force had been the support of ground troops during offensive and defensive operations (46.5% of all combat missions). Taking active part in the Red Army's offensives, our Air Force cleared the way for our infantry and tanks, and helped our ground troops make fast breaches in the enemy's defenses, swiftly pursue the enemy, surround and destroy his major troop groupings, force rivers, secure and maintain vital beachheads, and seize cities and fortified regions. Without the active and sweeping operations of our Air Force, the remarkable victory achieved by the Red Army, especially during the second and third periods of the war, would have been impossible.

The Air Force's actions during our offensive operations took the form of an air offensive which was initiated at the end of the first period of the war and represented a new stage in the development of the bases for the combat application of aviation. Instead of erratic and often organized strikes flown over a broad front and seldom far from our own advancing troops (which had been characteristic of the first year of the war), our air armies shifted to continuous support of infantry and tanks by the use of massed operations by bombers and assault aircraft. As a result of these purposeful operations by our Air Force, the rate of advance of our ground troops' offensive increased, losses due to enemy fire dropped, and its effect on the course and outcome of the offensive operation increased.

During defensive operations, the Soviet Air Force took an active part in repulsing enemy offensives. In close coordination with our combined-arms and tank armies, the airmen waged fierce combat with the enemy at every defensive line, destroyed advancing enemy reserves, and took effective actions in the interests of our troops waging counterstrikes. The massed operations by the Soviet Air Force helped achieve the goals of the defensive operations.

NASA

A no less important and pressing mission for the Air Force was the struggle for air supremacy, which was carried out by means of destroying enemy aircraft in aerial combat and at their airfields. More than a third of all our Air Force missions were flown with the objective of securing air supremacy, and 48,000 enemy aircraft were put out of commission. In addition, 9,000 aircraft were destroyed by fliers from other branches of aviation. Thus, the Soviet Air Force destroyed a total of 57,000 enemy aircraft, representing 62% of all the losses suffered by the enemy's Air Force during World War II and 74% of his losses on the Soviet-German front. If we take into consideration the fact that our Air Force also destroyed the best airmen of Nazi Germany and its satellites, the decisive role played by the Soviet Air Force in destroying the enemy's Air Force becomes quite apparent. /226

During the first two years of the war, the struggle against the enemy's Air Force was carried out under quite adverse circumstances due to the both numerical and qualitative superiority of the enemy aircraft. Nevertheless, on individual sectors of the front, our fliers succeeded in wresting air supremacy from the enemy, as was the rule, for example, in the counter-offensive at Moscow. In fact, by the summer of 1943 the Soviet Air Force had crushed the enemy Air Force's main strength and had once and for all seized strategic air supremacy, which it maintained safely until the end of the war. By so doing, the Air Force created favorable conditions for our Armed Forces to successfully carry out major offensive operations, and had also rid our rear areas of enemy bombers.

Operating in close coordination with the antiaircraft implacements of our nation's air defense system, the Soviet Air Force shielded Moscow, our nation's capital from the air and protect it against destruction. It also protected Leningrad, cradle of the October Socialist Revolution, and many of our most vital industrial and administrative and political centers throughout the country. From among all the capitals of the European nations during the last war, only Moscow was essentially spared of bomber assaults, although for more than six months it was a front-line city and the Nazi Air Force was given the special mission of destroying it from the air.

The Soviet Air Force paid close attention to aerial reconnaissance, which was the major and most maneuverable branch of reconnaissance. Aerial observers brought back valuable information on the nature of the enemy's defenses, groupings of enemy troops and aircraft, the make up and deployment of reserves, the functioning of communications, etc. Data achieved through aerial reconnaissance helped the Soviet Command see through the enemy's intentions in good time and make the right decisions in the course of armed conflict against Nazi Germany and its satellites. Without the reliable data on the enemy constantly supplied by aerial reconnaissance, it would have been impossible to count on success in even a single offensive or defensive operation. The skillful combining of the various capabilities of reconnaissance, the careful organization of the transmission and reception of reconnaissance data in headquarters and among the troops, and the use of our best-trained troops to carry out this mission -- all this made possible the reliability and effectiveness of aerial reconnaissance. /227

NASA

The Soviet Air Force also performed successful missions against reserves, communications, and objectives deep behind enemy lines. Flying strikes against railroad centers and stations, bridges, echelons concentrations, and truck columns, the Soviet fliers disrupted the planned concentrations and preparations of enemy troops for operations. Also effective were raids by Soviet aircraft against military and industrial objectives in Germany and its satellites.

During the war, the Soviet Air Force was the most maneuverable and highly mobile means of transport. It air-dropped Red Army elements, units, and commands behind enemy lines, carried out operational transport of troops and equipment to combat zones, dropped reinforcements, rations, supplies and medicine to beseiged cities and surrounded troops, evacuated the wounded and ill, and aided in the transport shifting of airfield maneuvers. The Soviet Air Force was relied upon to offer all types of aid to the mass partisan movement on a broad scale. Party workers, partisan movement leaders and demolitions experts as well as weapons, ammunition, and equipment were air-dropped behind enemy lines. Wounded partisans and children who had lost their parents were air-lifted from behind enemy lines. Soviet pilots flew more than 109,000 missions to aid partisans. The Soviet Air Force also gave substantial aid to the partisans of countries in eastern and southeastern Europe. The vast scope which the partisan struggle encompassed would have been unthinkable without active aid by Soviet aviation.

During the Second World War, as during other periods in the history of the Soviet state, a decisive role in strengthening the military might of our aviation was played by the Communist Party. During the first months of combat operations, when the Soviet Air Force was suffering substantial losses and was in an extremely grave position, the Central Committee of the CP USSR took every step to secure the uninterrupted growth of our aircraft pools and speed up the training of flight crews.

As early as the end of the first period of the war, the front had begun to receive such quantities of combat aircraft that they could not only replenish losses, but could steadily increase the number of aircraft available for the /228
field army. In December of 1942, aircraft production had increased 3.3-fold with respect to December of 1941, while aircraft engine production had increased 5.4-fold [274]. Later, aircraft production would continue to steadily increase. All in all, during the war, our aircraft industry turned out more than 136.8 thousand aircraft [275]. Nazi Germany, on the other hand, with the economic resources of almost all of Europe at its disposal, turned out somewhat more than 88,000 aircraft [276].

All of this is convincing proof of the superiority of the Soviet social system and the planned Soviet economy over the system and economy of Nazi Germany.

Along with the increasing quantity, the quality of our aviation technology increased as well. During the war years, 25 new types of aircraft included modernization were perfected and put into series production, more proof of the burgeoning scientific and technical creativity of the Soviet Union in the field of aircraft and engine design. At the same time, the German aircraft

NASA

designers managed to put only one new type of fighter -- the FW-190 -- and several modifications of the Me-109 and Ju-88 into mass production.

The new types of Soviet fighters, assault aircraft and bombers surpassed the enemy's aircraft in their basic mechanical and flying characteristics, the result of the great efforts made by our aircraft designers.

The Soviet people showed fatherly concern over the strength of our Armed Forces. In autumn of 1942, a patriotic movement got under way to collect funds for the construction of combat aircraft. Fighters, assault aircraft and bombers financed by the collection taken among workers, collective-farm workers and the intelligentsia began to make their appearance in our Air Force units. All in all, by the end of the war 2,565 combat aircraft financed by funds collected from workers in the Soviet Union had been handed over to the Air Force [277].

One of the most important factors in strengthening the might of the Soviet Air Force was the well worked-out system of training flight cadre and reserve aviation units. The command and headquarters personnel as well as the flight cadre and engineering and support personnel were trained in three military air academies as well as other schools and institutions. Re-training the flight and support personnel with the object of their mastering the new /229
aviation equipment and reforming the air units was carried out in the reserve air wings and brigades. Overcoming the difficulties of wartime, the Air Force's combat training centers turned out a number of flight and support personnel which proved sufficient to not only make up for combat losses, but also to serve as the basis for new formations. Graduates from the air academies, institutions, and schools answered the requirements of wartime, although they had been taught under "crash" programs. They proved themselves to be worthy sons of our socialist homeland. Many of them became Heroes and double Heroes of the Soviet Union, praised by their Air Force commanders.

The victories achieved by Soviet aviation were directly linked to the activities of its Party and political bodies.

The objective of all the Party and political work had been determined by the demands of the Party and people -- defeat the enemy, who had infringed upon the honor and freedom of our homeland. The most important role in the ideological propaganda was that of training Air Force personnel in Soviet patriotism and a burning hatred of fascism. In the work of the Party organizations and political bodies, special attention was given to questions of generalizing and spreading the combat experience, increasing the combat-readiness and combat-preparedness of our air units and commands, strengthening their organization and discipline, and carefully carrying out combat commands.

The Party and political work became more and more active, the more difficult and stressed the combat situation became.

The parties responsible for using their efforts to inculcate steadfastness and combat tenaciousness in the flight personnel in our Air Force units were the Party and Communist Youth League organizations, which were constantly being

NASA

supplemented with the best fliers, navigators, gunners, technicians and other aviators who had distinguished themselves in battle. The communist and Communist Youth League members made up 65-85% of the personnel in the air units, which significantly eased the load of organizing and carrying out their combat missions.

On conclusive indicator of the effectiveness of the Party and political work was the high morale of Soviet aviators, which lent them the greatest steadfastness, high skill and unparalleled heroism in combat. Evidence of their combat contributions as the number of government decorations, guard banners, and honorable designations awarded many units and commands of the Air Force.

For high combat skill demonstrated during the fulfillment of missions aimed at destroying the Nazi German invaders, more than 60% of the air units and commands were awarded decorations of the USSR, 288 front-line and long-range units, commands, and elements were awarded guard honors, and 708 were awarded honorary designations. The decree by the commander in chief noted 319 Air Force units and commands which had distinguished themselves during combat. /230

For carrying out their combat missions well, for their heroism and bravery, approximately 200,000 aviators were given government decorations, and 2,420 were awarded the Rank of the Soviet Union. Among the ranks of these fearless aviators, 65 were awarded two Gold Stars and two men were awarded three Gold Stars.

The Soviet people warmly revered the memory of their heroes. Many of the fallen aviators were permanently entered into the ranks of the units, and schools and Pioneer brigades as well as streets in cities and towns were named after them. Monuments were raised in their honor, and their heroic feats were retold in books and magazines, songs, poetry, and films.

The Soviet pilots forged their victories not only in the air, but on the ground as well. In summer's intense heat and winter's cold, in rain and snow, in mud and through impassable roads, frequently under enemy fire, the personnel from our air engineer corps, Air Force rear-area ranks, and communications units and other aviation services readied equipment for flight, prepared everything necessary for the Air Force's combat activity, repaired and rennovated materiel, and demonstrated selfless heroism in their work.

During World War II, the ranks of the outstanding military commanders and air corps commanders who skillfully led the Air Force's combat operations grew steadily. These included the Red Army Air Force's commander, Air Force Field Marshal A. Ye. Golovanov, his second-in-command Air Force Marshals G. A. Vorozheykin, N. S. Skripko, F. Ya. Falalyev, and S. A. Khudyakov, and General A. V. Nikitin, air army commander and presently Air Force Field Marshal K. A. Vershinin, Air Force Marshals S. A. Krasovskiy, S. I. Rudenko, V. A. Sudets, Generals S. K. Goryunov, M. M. Gromov, V. N. Zhdanov, I. P. Zhuravlev, N. F. Naumenko, N. F. Papivin, F. P. Polynin, S. D. Rybal'chenko, I. M. Sokolov, and T. T. Khryukin. The talented and resolute air corps and division commanders Generals F. A. Agal'tsov, Ye. Ya. Savitskiy (nor Air Force Marshals),

Generals I. D. Antoshkin, P. P. Arkhangel'skiy, Ye. M. Beletskiy, A. N Vitruk, S. G. Get'man, F. I. Dobysh, V. I. Davidkov, N. P. Kamanin, Ye. F. Loginov, M. G. Machin, I. D. Podgornyy, A. I. Pokryshkin, I. S. Polbin, S. D. Prutkov, V. G. Ryazanov, V. V. Stepichev, G. S. Schetchikov, A. V. Utin, V. A. Ushakov and many others all distinguished themselves.

During the war years, our Armed Forces saw the emergence of many talented generals and officers -- skillful organizers of Air Force direction and headquarters service, Party and political work, functions behind the lines, engineering service, and communications. A remarkable galaxy of renowned experts in aerial combat and bombing and assault strikes grew up in the ranks of our Air Force units and commands. /232

The Soviet Air Force, having struggled long and hard in its battle against the Nazi Air Force, ended the war still more powerful and combat-ready. Its aircraft pools had more than doubled by the end of the war. All this was the result of the coordinated efforts of the men at the front and those behind the lines. The might of our Soviet Air Force was forged during fierce battles at the front, in the shops of aircraft factories, and in the scientific laboratories and Design Bureaus. This might, created during intense combat, is the result of the work of all the Soviet people who, under the guidance of the Communist Party, achieved a heroic feat in their struggle with fascism which remains unparalleled in the history of mankind.

In evaluating the outstanding contribution by Soviet Armed Forces to the defeat of the enemy during World War II, the Central Committee of the CP USSR stated in documents dedicated to the 50th Anniversary of the Great October Socialist Revolution:

"The Soviet Armed Forces were the victors in this war. Created to defend the achievements of that great October, they have proudly carried their combat banners throughout the entire history of the Soviet state. The feats performed by Soviet fighting men during World War II will never be forgotten. In addition, the great victory of fascism was brought about through the supremacy of Soviet military science and military heart" [278].

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The Red Army Air Force Command and Commanders of the Air Units Whose Pilots Dealt the Crushing Blows to the German Invaders. Left to right (in the front row): S. D. Rybal'chenko, A. V. Nikitin, G. A. Vorozheykin, A. I. Shakhurin, A. A. Novikov, N. S. Shimanov, F. Ya. Falaleyev and A. K. Repin. In the second row: N. F. Papivin, F. P. Polynin, N. F. Naumenko, V. A. Sudets, S. I. Rudenko, T. T. Khryukin, V. N. Shdanov, K. A. Vershinin, S. A. Krasovskiy, S. K. Goryunov and I. P. Zhuravlev.

CHAPTER 5

SOVIET AVIATION IN THE POST-WAR PERIOD

ABSTRACT. This chapter presents a description of Soviet air technical developments, Soviet military doctrine is related to air power and peace time operations of Soviet aviation since the second world war. Photographs of a few Soviet military aircraft are presented. The operations described include aid to the civilian populus during natural disaster and interception of intruding American aircraft.

Jet Aircraft /233

The war was over. Millions of victorious fighting men returned home and set about their peaceful labors. The units and commands retained after the demobilization were put on peace-time strengths and were transferred to regions of constant disposition. Many veterans of aerial combat from the ranks of the Air Force took their well-earned rests, and soldiers and officers from air units broken up as a result of the end of the war went home.

The soldiers and sergeants, officers and generals remaining on duty in the Soviet Army set all their efforts about strengthening the defensive might of the Soviet state. They had seen that, after the end of World War II, the aggressive cliques in the imperialist countries, primarily the United States of America, had launched the "cold war", and had started instigating new military provocations aimed at the Soviet Union and other countries of the socialist camp.

The difficult international situation and the aggressive politics of the imperialist nations forced us to constantly bear in mind V. I. Lenin's provisions concerning the necessity of maintaining constant watchfulness and keeping the Soviet Union's defensive might at the required level. The Communist Party devoted great care toward strengthening the Soviet Armed Forces, including the future development of the Air Force.

During the period from 1947 to 1950, the Central Committee of the All-Union Communist Party and the Council of Ministers of the USSR passed a series of resolutions on the question of rearming the Air Force with new equipment, training highly qualified personnel for the Air Force, and increasing the level /234 of combat readiness of our Air Force units and commands.

The burgeoning Soviet economy was a solid basis for the further development of our aviation technology. In the very first post-war years, our scientists and designers, engineering and support personnel, and workers in our aircraft factories learned out to create qualitatively new aircraft with the most modern equipment and armament. Design Bureaus run by A. N. Tupolev, A. I. Mikoyan, M. I. Gurevich, A. S. Yakovlev, S. V. Ilyushin, S. A. Lavochkin, A. M. Lyul'ka and G. M. Beriyev produced excellent models of jet aircraft and engines.

Test pilots worked along with the designers in improving our combat aircraft. The test pilot's work was difficult and demanding, requiring boldness and calculated risks, courage and presence of mind, a fine knowledge of aerodynamics, and precision in piloting which approaches automation. It is precisely these qualities that were demonstrated by our pilots who first mastered jet technology. Often risking their lives in the name of the further advancement of aviation, they courageously delved into the realm of the unknown and sought the secrets of high-speed flight.

It is an established fact that the first jet airplane was put into the air in our country in the spring of 1942 by test pilot Captain G. Ya. Bakhchivandzhi. Four years later, on 24 April 1946, one of our airfields was the site of the first takeoff of a new jet aircraft. This was the Mig-9, flown by engineering Lieutenant Colonel Aleksey Nikolayevich Grinchik. On the same day, test pilot M. I. Ivanov made a successful flight on another type jet -- the Yak-15. And thus the jet age was born.

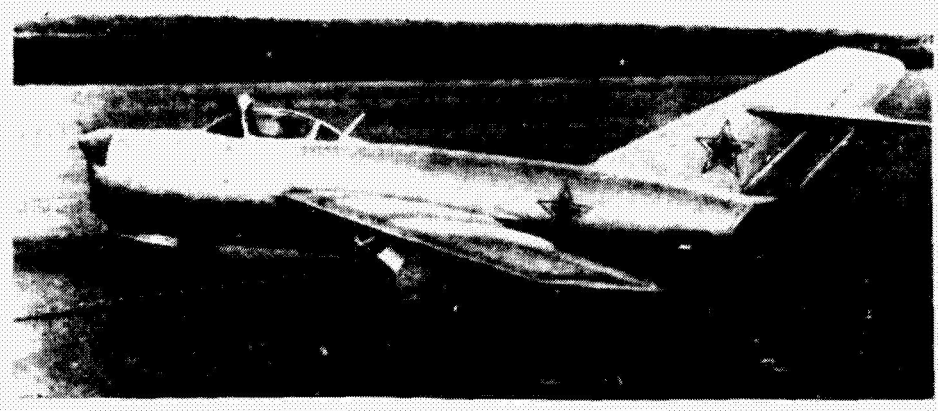
Along with Grinchik and Ivanov, M. L. Gallay, G. M. Shiyanov, L. I. Taroshchin, Ya. I. Vernikov and P. M. Stefanovskiy also test flew the experimental series of jet aircraft.

During test flights in June of 1946, Lieutenant Colonel Grinchik, a talented flier, died heroically. But the tragic loss of this test pilot did not allow our fliers to stop with their work only half done. His successors mastered newer and newer examples of jet technology. Yu. A. Antipov, A. G. Kochetkov, A. N. Kuvshinov, G. A. Sedov, A. G. Kubyshkin and I. M. Dzyuba and others flew newer and newer jets.

The first to receive the high rank of Hero of the Soviet Union during peacetime were the test pilots. In 1948, the Presidium of the Supreme Soviet of the USSR awarded this rank to test pilots Colonel M. I. Ivanov, Major I. T. Ivashchenko, Air Force Major General P. M. Stefanovskiy, and Colonel I. Ya. Fedorov [279]. The Mig-9 and Yak-15 aircraft showed superb flight qualities. The aircraft industry began their serial production. The jet fighters were quickly perfected. In little more than a year, the first jet model, which was essentially a transitional model, was replaced by aircraft with swept-back wings. These were the La-15 and Mig-15 and, after them, the Yak-23, Mig-15a and Mig-17. Airplane speed rapidly increased. Test pilot I. T. Ivatsenko, in a Mig-17, was the first to exceed the sound barrier. /235

NASA

Our bomber Air Force also received new aircraft. In 1949, the front-line Il-28 jet bomber was put into serial production.



The Mig-15 Jet Fighter.

It was only in our long-range aviation that heavy piston-engined craft remained. These were the four-engined Tu-4 aircraft, which went into production in 1947. However, these piston aircraft differed radically from those used during the Second World War in terms of the mechanical and flying characteristics and especially their various electronic instruments. Early in the 50's, long-range jet bombers designed by A. N. Tupolev began superceding the Tu-4.

Along with the creation of military jet aircraft, the Soviet aircraft industry was successfully handling the task of turning out new transports and helicopters. Our military transport aviation was equipped with the Il-12 and Il-14, which were designed for moving military equipment. The Mi-1 and then the Mi-4 helicopters designed by M. L. Mil were beginning their successful application in military aviation. /236

Aircraft equipment and armament improved markedly. Jet fighters were equipped with 37- and 23-mm cannons. In addition, the cannon became the defensive armament of bombers. The extremely simple optical gun-sites were replaced by semi-automatic siting apparatus. Interceptors such as the Yak-23 and the Mig-17p were equipped with radar sites.

The caliber of bombs increased, and their nomenclature broadened. Aerial demolition bombs weighing up to 9,000 kilograms started being used. At the same time, work was proceeding intensively on the development of an atomic bomb, which was created in our country in 1947 and tested in 1949. Nuclear weapons appeared first as a means of inflicting damage which could be used only by aviation.

Bomber sites changed substantially. Instead of synchronized optical sites, panoramic radar sites were used which made it possible to perform on-target bombing without visual siting of the earth's surface. To achieve reliable air navigation and precise bombing under any weather conditions, azimuthal and ranging electronic systems began to be used. The aircraft were equipped with radio altimeters and other more sophisticated instruments.

The broad application of electronic equipment both in the aircraft and on

the ground substantially broadened the possibilities of flight under bad weather conditions both day and night. The use of radio electronics made it possible to increase the accuracy of bombing and cannon fire.

A major task for our Air Force personnel was that of mastering this new high-quality equipment.

To train fighter pilots to handle jet aircraft, in the autumn of 1946 a special center was created which was commanded by the experienced flier Colonel P. S. Akulenko. Initially, instructors at that center were fliers who had test-flown jet aircraft. They passed on their knowledge and skills to the command pilots of military air units and institutions who, in turn, instructed other fliers in handling jet aircraft. The fliers S. D. Gorelov, I. D. Koshel', A. K. Pakhomov, I. P. Polunin, Ye. Ya. Savitskiy, N. I. Khramov and P. F. Chupikov quickly mastered these new aircraft. /237

Colonel I. P. Polunin was one of the first to perform all the aerobatic maneuvers in a jet fighter. This brave flier demonstrated his skill at the Tushino Air Show in August of 1947. Group aerobatics were performed by Lieutenant Colonel N. I. Khramov assisted by Lieutenant Colonel V. V. Yefremov and Major P. G. Solov'yev. A quintet of fighters headed by A. S. Babayev demonstrated precise calculation and remarkable piloting skill.

Captain V. S. Lapshin and Major V. M. Fokin became pioneers of the most complicated types of maneuvers in jet fighters. In the early 50's at the Tushino Air Show, they more than once demonstrated piloting on collision courses, when the aircraft were flying toward each other at fantastic speeds and would then at the very same instant shoot upward in a "chandelle" maneuver.

The Soviet aviators carried out their responsible and proud mission of mastering flight in jet aircraft with great enthusiasm. By as early as the end of 1947, approximately 500 pilots were flying solo in jet fighters [280]. Hundreds of engineers and technicians were learning to properly handle the new materiel. In 1947, for their successful mastering of the new technology, the Presidium of the Supreme Soviet of the USSR awarded decorations and medals to more than 700 fliers, navigators, and technicians -- the advance ranks in combat and political training [281].

Using these new and highly sophisticated aircraft would have been unthinkable without a broad theoretical background. Immediately after the end of World War II, training was organized for the airmen in our air units both in basic aerodynamics, aircraft design, and the theory of their combat application, as well as disciplines in general fields. Yearly examination periods were introduced to check how well the material had been mastered.

The pilots and navigators, gunners, radio operators and technicians took to their studies with great enthusiasm. In specially formed classes both at the airfields and in their aircraft, they obtained a thorough knowledge equally necessary for fulfilling their service debt. As early as the first examination period, given in 1947, 84% of the aviators received outstanding marks. In the

next year, the number of outstanding and good marks was increased to 93%.

Rearming the Air Force with new sophisticated equipment substantially broadened the area of possible application of Air Force units. One of the primary tasks of all the personnel became the mastery of flight under bad weather conditions, both day and night. Taking into account the vital significance of this question, the Council of Ministers of the USSR issued a special resolution [282]. /238

In their Resolution, the Council of Ministers outlines the priorities in equipping airfields with instrumentation required for instrument landing. The Council of Ministers established the classification of flight personnel and made the decision regarding privileges and awards to flight crews making day and night flights under bad weather conditions. At the same time, special ribbons were introduced for pilots and navigators of the first, second and third classes. Some of the first to pass their first-class examinations were Generals V. G. Grachev, Ye. Ya. Savitskiy, and I. L. Fedorov, Colonels P. F. Vladimirov, V. M. Lavskiy, and V. A. Lutskiy and others. By November of 1950, 74% of the pilots and navigators had become first-class specialists. In days to follow, their numbers increased even more. This was especially true with respect to the numbers of first- and second-class aviation specialists.

In actual combat training, the aviators mastered all the newest means of using their jet aircraft. Many units and commands, the crews made flights at extremely high altitudes and through solid multi-layered cloud cover but in ascents and descents.

The pilots and navigators in our bomber aviation studied the use of radar as well as synchronized optical sites for precisely hitting assigned targets. Crews of the Tu-4 heavy bombers flew over long-range routes and made bombing runs at unfamiliar test areas.

Many fighter pilots thoroughly mastered the use of their jet aircraft and worked out means for intercepting aerial targets on the basis of radar data, as well as mastering the automatic site instruments. In 1950-1952, first fighters and then front-line bombers began training with flights from dirt-surfaced runways. The Air Force press noted the great successes in both combat and political training achieved by First Lieutenant I. Ye. Abramov, Captain N. V. Aleksandrov, Major P. M. Balabolov, Major I. A. Yeldyshev, Lieutenant V. I. Lobov, Captain V. A. Ukhov and others.

Our fighter pilots vigilently carried out their duties of protecting the aerial boundaries of the USSR. They would take to the air on the first signal indicating the appearance of an intruder aircraft.

On 8 April 1950, an American heavy bomber was flying east over the Baltic Sea. The operators at our radar station constantly tracked the flight of this foreign aircraft. The uninvited guest crossed our national boundary and intruded into the Soviet Union's airspace. The command was immediately issued for the fighter element on duty to take off. /239

At this time, one of the forward flights on duty at one of the airfields was commanded by First Lieutenant B. P. Dokin, a man who had taken part in World War II. Upon signal from the command point, the fighters swiftly took to the air.

The pilots precisely carried out the instructions from their ground command point. Several minutes went by, and they observed the intruder aircraft, which was attempting to evade our fighters. The crew of the American plane did not chose to carry out our pilots' order to immediately land at a Soviet airfield. Continuing their flight, they opened fire.

The Soviet pilots, fully aware of their instructions to defend our homeland's air boundaries, pressed the trigger buttons of their own guns. The intruder soon fell to the sea.

The centries of our air boundaries had done well. The Presidium of the Supreme Soviet of the USSR awarded First Lieutenants A. S. Gerasimov and B. P. Dokin and Lieutenants Ye. T. Satayev and I. I. Tezyayev the Order of the Red Banner [283].

Soviet military doctrine provides for the broad use of the Air Force in defending the homeland.

The aviation's growing military possibilities raised the question of its possible war-time use in dealing crushing blows against the main groupings of enemy ground and naval forces, as well as its being of vital use in hitting objectives behind enemy lines, including industry and transportation.

During World War II, the probable depth of penetration of aviation behind enemy lines and the proposed strength of its strikes had increased substantially. This fact laid the way for the further expansion of the role of the Air Force. Special attention was paid to the question of the battle for air supremacy. Achieving air supremacy was of extremely vital significance inasmuch as it was this which dictated the entire course and outcome of armed conflict as a whole. Therefore, the questions of organizing and directing combat with a possible enemy's Air Force took on great significance in Soviet military theory.

In working out questions of military art during the early post-war years, /240
the Air Force constantly took into account experience gained during the past war. Field manuals and instructions issued at that time reflected views which had been complicated as a result of activities during the war years. They also reflected all the changes which had taken place with respect to the rearming with jet aircraft.

By the early 50's, new manuals and regulations had been issued for the military operations of all branches of aviation.

To regulate flights by aircraft from various departments, in 1948 the Soviet government instituted the Air Code of the USSR, which regimented the flights and priority of operations by the crews of military and civil aviation.

Subsequently, the Air Code of the USSR was repeatedly revised and reissued.

Taking into account the growing significance of the scientific basis of questions concerning the structure of the Air Force and the development of the theory of its application, the Soviet government paid close attention to spreading about the military science work in the Air Force. To this end, special scientific research organizations were established. In addition, higher military air educational institutions also took an active part in scientific work. Young scientists got into military science. In the Red Banner of the Order of Lenin Air Force engineering Academy imeni Professor N. Ye. Zhukovskiy alone, two doctoral and 13 masters' dissertations were defended in 1945 [284].

In the late 40's, many steps were taken to strengthen the organization of our long-range and military transport aviation. In 1946, long-range aviation, which had obtained organizational independence, was created. At the same time, airborne transport aviation was formed.[1]

The organizational structure of the units and commands underwent substantial changes in the early post-war years.

In these early post-war years, many officers with a good deal of combat experience did not reinforce it with deep theoretical study. By 1 December 1945, 22% of our Air Force officers had no special military training.[285] There were very few officers and generals in the ranks who had graduated from military academies. Therefore, the Communist Party and Soviet government paid special attention to training highly-qualified cadre.

Training of pilots, navigators, and mechanics took place in the mid-level aviation institutions. In addition, training of support personnel began in the newly opened higher aviation technical institutions. /241

In the post-war years, many of our renowned Air Force fighting men obtained higher military training. In the Red Banner Military Air Academy alone, approximately 480 heroes and 28 double Heroes of the Soviet Union obtained training. Triple Heroes of the Soviet Union I. N. Kozhedub and A. I. Pokryshkin also successfully completed their studies in the academies.

The existence of well-trained and highly-qualified cadre was one of the immutable conditions for the further development of the Soviet Air Force. Enlisted men, sergeants, officers, and generals in our Air Force tirelessly strengthened the Soviet state's air might. Each passing day saw an increase in the military capabilities of our Air Force, which vigilently defended the peaceful labor of the Soviet peoples.

[1] Subsequently, airborne-transport aviation was transformed to transport-airborne, and then to military transport.

VASA

Preparing a Combat Aircraft for Take Off.

In a Few Minutes, a Heavy Transport Aircraft Will Take Off.

Climbing.

Or Alert.

Supersonic Fighters in Flight. Tushino 1961

A Group of Heavy Turbo-prop Helicopters Landing at the Tushino Airfield and Unloading Military Equipment during the Air Show of July 1961.

An Urgent Report.

Under New Conditions

A major factor resulting in radical changes in the types and means of application of military aviation was nuclear armament. Because initially nuclear armament was represented only by atom bombs, for several years aviation held a monopoly as the sole carrier for such weapons. This fact resulted in rapid progress in building the Air Force.

At the XX Congress of the Communist Party of the USSR, it was noted that the Party Central Committee and the government were placing special attention in the development of the Air Force as the major means of maintaining the

security of our homeland. Presently the USSR has at its disposal a first-class jet-equipped Air Force capable of carrying out any mission which might confront it in the event of attack by an ggressor.

Aviation technology developed rapidly. There was a great increase in the creative achievements of our Design Bureaus led by A. N. Tupolev, O. K. Antonov, A. G. Ivchenko, S. V. Ilyushin, V. Ya. Klimov, N. D. Kuzmetsov, A. M. Lyul'ko, A. I. Mikoyan, V. M. Myasishchev, P. O. Sukhiy, S. K. Tumanskiy, A. S. Yakovlev and others.

Our fighter Air Force obtained supersonic aircraft. The 1953 Air Show at Tuchino saw the demonstration of heavy jet bombers with extremely long ranges. In 1955 appeared a new jet aircraft designed by V. M. Myashishev. /242
The first model of this aircraft was flown by test pilot F. F. Opadchiy and navigator A. I. Pomazunov [286].

The development of heavy aircraft can be seen through the creation of jet airliners. On 17 June 1955, the Tu-104, which was designed on the basis of progress achieved in designing heavy military aircraft, made its first test flight. Later, newer and newer models of jet passenger liners would appear: the Tu-114, Il-18, An-10, and others. On one serially-produced Tu-114, test pilot V. K. Fobrikov and his test navigator N. S. Zatsepoy in June of 1958 flew 34,400 miles across the USSR, staying in the air for 48 hours. All the flights and landings took a total of only 77 hours [287].

In 1957, basically new aircraft were tested. The first-class pilot U. Ya. Garnayev was the first to take off in a VTOL turbocraft. Almost simultaneously, Hero of the Soviet Union Colonel V. G. Ivanov test-flew a catapulted aircraft. The era of aviation without airfields was born [288].

Helicopter production increased. The Mi-6 with its turbojet engine was developed in M. L. Mil's Design Bureau. Our pilots lifted a record load to heights of 2,000 and 5,000 meters on A. S. Yakovlev's Yak-24 supercargo helicopter. N. I. Kamov's K-15, K-18, and K-10 helicopters could be used for the most varied problems in military aviation.

The Soviet government paid high tribute to the work done by the men who created these new types of aircraft. Aircraft designers were repeatedly awarded the Lenin prize.

Taking into consideration the heroic efforts by test pilots in new aircraft, the Presidium of the Supreme Soviet of the USSR in August 1958 awarded the honorary rank of "Honored Test Pilot of the USSR" and "Honored Test Navigator of the USSR." Late in the 50's, more than 30 of our best test pilots were awarded the rank of Hero of the Soviet Union. Among those who were grated this rank was S. N. Anokhin, Yu. A. Antipov, S. G. Brovtsev, A. N. Gritsianskiy, M. L. Gallay, N. I. Korovishkin, A. M. Kuvshinov, M. A. /243
Nyukhtikov, F. F. Opadchiy, N. S. Rybko, A. V. Sarygin, G. A. Sedov, G. M. Shiyanov and others.

Our aircraft were equipped with more and more modern instruments and

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Even
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odd

S. N. Anokhin

armament. Our fighters started having their cannon armament replaced by air-to-air missiles.

The introduction of various electronic instruments broadened aviation's capabilities. Fighters could now intercept airborne targets at night under bad weather conditions with a high degree of success. Our bombers could hit their assigned targets from high altitudes above the range of visual siting.

Our assault aviation equipped with obsolete Il-10's were replaced by fighter-bombers initially armed with the Mig-15a jet fighters. Later, our designers were to develop a special type of jet fighter-bomber.

Fighter-bombers capable of being armed with conventional and nuclear weapons became the major means of striking small mobile targets which would suddenly make an appearance.

The quantitative and qualitative increase in transport aircraft and helicopters permitted the assignment of broader and broader missions to our military transport aviation, which had basically completed its organizational rearrangement as an independent branch of the Armed Forces.

Various pilotless craft were taken on as armament in the Air Force. Winged ground-to-ground missiles could now be reliably used to make strikes against the most varied type of objectives without being repulsed. With the appearance of air-to-ground missiles, it became possible to broaden the capabilities of striking targets since these rockets could be launched a substantial distance away from the objective. /244

This more sophisticated aviation technology required an increase in the demands made upon the Air Force flight and support personnel. Their training became more protracted. The crews were required to have an extensive background in mathematics, physics, and general technical disciplines. Crews were trained with broad backgrounds in the physical and mathematical sciences.

In a speech at a reception for graduates from Air Force engineering academies in March of 1958, Air Force Field Marshal K. A. Vershinin, the Air Force Commander in Chief, stated: "During the post-war period, and especially in recent years, the development of combat equipment, particularly as related to the field of aviation (piloted and pilotless aircraft, winged and ballistic missiles, and means of control and automation), has challenged all aviators and especially the higher educational insitutions with newer and newer tasks" [289].

There was an even greater increase in the role of our military science institutions working in the field of improving aviation technology and developing the most efficient means of applying it. They began to devote serious attention to the problems of automated control using computers.

The changing technology resulted in increased demands made to flight crews and the men organizing combat training. Young cadres capable of creatively approaching solutions to these new problems were given responsible positions. Thus, all the newly appointed commanders were first- and second-class pilots.

The increase in aircraft speed and rate of climb, the appearance of nuclear armament, the use of rockets by our air-defense teams throughout the country all resulted in the assumption of staggered formations in the ranks of our air units and commands. Under these circumstances, aviator combat training was directed toward developing and encouraging pilot initiative and in perfecting mastery of this complex equipment.

During combat training, flights in small groups at high altitudes, and takeoffs and landings on dirt runways were practices.

Our fliers successfully mastered flights in the far north. It became common practice for Soviet pilots to carry out combat training missions in regions thousands of kilometers from their main bases. Our long-range aviation also carried out flights with extremely long radii of action, including inflight refueling.

Despite the fact that Soviet aviators had to struggle with new and more complex missions, they proudly fulfilled their military debt. The number of air units whose pilots had flown for long time periods without any accidents steadily increased. /245

In August of 1955, the personnel from one of our bomber wings celebrated its tenth anniversary of accident-free operation. The wing's outstanding officers A. P. Baranov, N. P. Vozzhennikov, A. G. Lashov, A. S. Pan'kov, I. A. Slin'ko, S. I. Titunin, S. V. Sheshukov and its commander Lieutenant Colonel A. I. Romanov achieved outstanding successes in their combat training by strictly carrying out the commands and regulations and through their carefully organized flights [290]. In August of 1957 a special order from the commander in chief of the Air Force took note of ten years of accident-free operation by the N-th fighter air wing, commanded by Colonel L. N. Korchagin.

In carrying out training flights, our pilots demonstrated high skill and true heroism. During one such flight in an aircraft piloted by Captain A. Ye. Lakusha, the craft was struck by ball lighting and the power supply system for all its instrumentation was knocked out. The engine died. However, the pilot was not one to lose his head even in such a difficult position. His extensive experience and good theoretical background helped him to make the right decision. Radioing his flight commander as to what had happened, Lakusha began attempting to restart his engine, acting strictly according to instructions. Suddenly the engine caught on. The flier returned to his base and landed safely.

On 28 September 1954, during a test flight, the control system of a heavy jet aircraft went out. It would have been unfortunate to lose a tested model of a new aircraft. Taking into account that the accident had occurred at a high altitude, the pilot Major A. I. Kazakov, navigator Captain V. S. Tikhomirov, and First Lieutenant Yu. G. Shestakov decided to attempt to save the expensive craft. With his comrades' aid, Kazakov looked for a way of maintaining the maneuverability of this heavy craft. The brave men dropped 4,000 meters along with their craft, and finally the correct solution was found. The pilot put the plane into a dive. Then, smoothly working the rudders, at an altitude of 1,200 meters he pulled his plane into horizontal flight. Several minutes of flight passed -- and there appeared a familiar airfield. The heavy craft's landing gear touched the concrete runway. A difficult flight had ended. The crew, it seemed, had achieved the impossible. For this feat, Major A. I. Kazakov was awarded the Rank of Hero of the Soviet Union, and Captain V. S. Tikhomirov and First Lieutenant Yu. G. Shestakov were awarded the Order of the Red Banner [291]. /246

In April of 1958, there was heavy flooding in the Altai Mountains. During these days, the Air Force came to the aid of the civilian populace. A bomber crew commanded by Major I. I. Yermilov made precise drops of bombs onto ice-blockings, and by destroying them lowered the water level in the Ob' River.

The helicopter crews in Major Saburov's unit responded well in answering a call from inhabitants in the flooded region. Here is how they were looked upon by the inhabitants in the village of Ust'-Anuy:

"The fliers performed bravely and selflessly. They picked up women, old men, and children from roofs and ice-floes, landing their helicopters in the most difficult terrain. We would like very much to thank our rescuers, but we don't even know their names. We did manage to keep the numbers of the helicopters they flew -- 12, 14 and 15" [292].

Who were they, these brave fliers who took such concern over the welfare of the people? They were Captain I. S. Tatishchev along with First Lieutenants P. S. Sidel'nikov and S. L. Fedotov. This trio of brave men worked tirelessly and saved dozens of human lives.

Hundreds of fliers, navigators, and mechanics achieved the honorable right to be called Outstanding in Combat and Political Training. Our military press repeatedly carried the names of the leaders V. G. Buchin, V. N. Gvozdyuk, V. P. Donin, A. M. Zhilin, Yu. M. Zaytsev, P. M. Lemeshev, A. A. Negin, V. M. Romanov, S. N. Sokolov, G. V. Utkin and others.

Under conditions of unceasing provocation on the part of the imperialist states, countries in the socialist camp took steps to strengthen their defensive might. In May of 1955, the United Military Forces of the Warsaw Pact were created. This even further strengthened the comradeship-in-arms among aviators from the various countries of the socialist camp.

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On the basis of the generality of political interests, joint efforts on the part of the aviators from these friendly armies were planned. They

tirelessly strengthened the military might of the combined Air Forces.

Similarities in types of aircraft, a single methodology for combat training, and common views as to the application of the Air Force served and still serve as a dependable guarantee of close cooperation among pilots and technicians of the Soviet Air Force with those of other socialist states.

Many pilots and air commanders have graduated from Soviet Air Force flight /247
schools. Aviators from the friendly armies frequently meet and swap experience as to combat training and compete for best performance in carrying out routine missions.

Our fliers vigilently guard the peaceful Soviet skies. They foil all attempts by foreign aircraft to intrude upon the air space of the USSR.

On 4 September 1954, an American Neptune aircraft crossed our border in the region of the Port of Nakhodka. Two of our fighters took to the air to intercept the intruder. To their demand that the foreign aircraft follow them and land, the aerial pirates opened fire.

Our pilots were forced to attack the transgressor of our boundary. After persistent attack by the Soviet pilots, the American plane was forced to lose altitude and move out to sea [293].

In the five year period from 1954 to 1958, the Soviet Air Force took a new and major step in its moderization. As a result of the appearance of nuclear weaponry and rocket technology in military affairs, radical revolutionary transformations occurred which directly involved our Air Force. Views changed toward the nature of the Air Force's combat activity during war. The operational ability of the Air Force and tactics of branches of aviation took a new approach toward solving many vital problems in the organization and carrying out of combat activities by Air Force units and commands.

With broad combat capabilities at its command, Soviet aviation could solve major problems. It was the major means of substantially increasing the defensive might of our state.

In evaluating the role of aviation at a major gathering of the Moscow Soviet dedicated to the 40th Anniversary of Soviet Armed Forces on 22 February 1958, Marshal of the Soviet Union R. Ya. Malinovskiy, Minister of Defense of the USSR, stated:

"The might of Soviet aviation has grown immeasurably. Its armament now includes jet and turbojet, long- and super long range bombers, supersonic jet fighters, and up-to-the-minute transport aircraft and helicopters. The high mechanical and flying characteristics of these aircraft and their new and more sophisticated armament permit our Air Force not only to engage in combat in conjunction with our ground troops and navy, but to single-handedly handle any major strategic mission" [294].

Early in the 60's, there were radical and revolutionary transformations in military affairs. The essence of these revolutionary changes in the field of armament, military equipment, and military theory consisted of the following: on the basis of the mass production of nuclear armament and rockets, the rearmament of all branches of the Armed Forces had taken place; a new military doctrine had been developed; ways and means of carrying out armed conflict with rockets and nuclear war had been determined; and personnel had essentially achieved mastery of modern means of warfare and were capable of acting when these means were used on a broad scope.

Especially great value was attributed to the greater improvement in nuclear weapons. Our country created nuclear charges of various powers right up to nuclear bombs the equivalent of 100 megatons of TNT. One such bomb, with the power of 50 megatons, was successfully tested in 1962 [295].

Resolutions passed by the XXII Congress of the Communist Party of the USSR and our Party's new Program devoted great attention to the problems of strengthening the defensive might of the Soviet Union. Documents from the Congress and Program include direct provisions that the Soviet Union shall strengthen its defensive might due to the continuing military danger from imperialist states. Bearing in mind that rocketry and nuclear armament will play a decisive role in a future war, our Party has at the same emphasized the necessity of modernizing all branches of arms, and developing all branches of the Soviet Union.

"The Soviet state," -- it is written in the Program -- "will work to maintain that its Armed Forces are powerful and have the most modern means of defending the homeland -- atomic and thermonuclear weapons, and rockets with all necessary radii of action to support, at the proper altitude, all types of military equipment and weaponry" [296].

Proceeding from the decrees from the XXII Party Congress, the Soviet people continued to devote special attention to the further development of aviation. In military aviation as in other branches of the Armed Forces, there were radical changes.

First, the basic means of combat used in aviation became atomic weapons. Front-line and long-range aircraft might be carrier aircraft for atomic bombs or rockets with atomic warheads.

Secondly, our aviation was re-equipped with rocket-carrying aircraft and /249
supersonic aircraft.

Thirdly, there was a qualitative change in our aviation's controls. Electronic equipment took on a much broader application, and automated guidance systems came into use.

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Fourthly, concepts of the role of the Air Force and the nature of its combat activities were reevaluated. As a result, new commands and regulations

designating the Air Force's combat activity were issued.

Fifthly, personnel in Air Force units and commands mastered the precepts of using the new technology and worked out means of applying it under the conditions of rocket and nuclear warfare.

As a result of the development of more sophisticated aerodynamic aircraft designs, increased engine power and the use of new materials by Soviet designers, aircraft industry workers were able to produce high-quality aircraft capable of reaching the stratosphere and covering greater distances at heretofore unimagined speeds.

Top fighter speeds were two- to three-fold greater than the speed of sound. The rapid increase in flight speed can be judged by the countless records earned by our pilots.

In October of 1959, the pilot G. K. Mosolov flew an E-66 at a mean speed of 2,388 kilometers/hr. During one pass, his speed exceeded 2,500 kilometers per hour [297]. The top speed established by the American W. Irwin was substantially exceeded. On 22 November 1961, the United States Air Force succeeded in re-couping their forfeited record. The pilot Robinson flew at a speed of almost 2,600 kilometers per hour. But the Americans were not first for long.

G. K. Mosolov

G. K. Mosolov, Hero of the Soviet Union, /250 again beat the world record. In July of 1942, flying an E-66, he showed a speed of 2,678.5 kilometers per hour, and on one pass the needle on his speed indicator reached 3,000 kilometers per hour [298].

Test pilot Grigoriy Konstantinovich Mosolov had travelled a bright and eventful creative path. Graduating from an aviation institution in the post-war years, he soon demonstrated the acception talents of a first-class pilot: courage, precision, lightening-fast reactions, and a thorough knowledge of technology. The young pilot's outstanding capabilities were rapidly noticed by his commanders. He was assigned to test-fly combat aircraft. And it was here that Mosolov felt that the theoretical knowledge he had acquired at school was not enough. He set about taking correspondence courses from the Moscow Air Institute. It was difficult to combine his day-long test work with studies. He had to spend countless sleepless nights mastering strength of materials, gasdynamics, and the theory of aircraft design, and sketching out countless sheets of diagrams. But all these difficulties had been left behind. In 1959 the pilot's diligence and deep knowledge were rewarded by a diploma with honors.

And high-pressured creative work resumed: flights on swift-winged aircraft and participation in the most varied tests of new aircraft. The engineer and test pilot broke several world records in succession. In April of 1961 he flew to an altitude of 34,200 meters, setting an absolute record in flight altitude. After his altitude record, remarkable speed records followed.

In 1962, one of G. K. Mosolov's flights ended unsuccessfully. On 11 September he had to bail out of a malfunctioning aircraft flying at great speed. In catapulting out of the craft, the pilot suffered severe injury and parachuted into the woods where he was found. Mosolov was sent to the Moscow Hospital imeni S. P. Botkin. Doctors M. A. Savinkovich and V. F. Pozharskiy struggled day and night to save the hero's life. Renowned surgeons came to him. Upon orders from the Chief Designer, whose aircraft the pilot had been testing, the necessary medical apparatus was designed in the aviation Design Bureau. The efforts of his countless friends did not go unrewarded. Grigoriy Konstantinovich's life was saved.

In addition to Mosolov's achievements, a whole series of world records in speed, distance, altitude and rate of climb were established by B. M. Adrianov, N. I. Goryainov, V. S. Ilyushin, A. A. Koznov, K. K. Kokkinaki, A. S. Lipko, P. M. Ostapenko, B. M. Stepanov, A. V. Fedotov and others.

Thus, in 1959, the pilot Stepanov flying a 201M rose to 13 kilometers /251
with a load of 55,200 kg. Behind him and in the very same aircraft, A. S. Lipko flew 1,000 kilometers with a load of 27 tons at a speed of 1,028 kilometers per hour. In the latter flight, seven world records in speed and load were broken at the same time [299]. In 1959, one model of a serial produced combat aircraft flew without refueling for 17,150 kilometers in 21 hours and 15 minutes. After landing, the aircraft still had enough fuel in its tanks to permit another hour's flight [300].

Brilliant proof of the superior qualities of Soviet aircraft and the crews' skill is the air records achieved by the Soviet Union. On 1 January 1964, out of a total of 545 records recorded by the International Federation of Aviation Sports, 236 had been won by our country, and only 150 had been won by the United States of America [301].

On 9 July 1961, an immense air show dedicated to Aviation Day took place in Moscow's Tuchino Airfield. During the show, the remarkable achievements of Soviet aviation technology were demonstrated.

Groups of supersonic fighters headed by Colonel P. F. Manturov, Lieutenant Colonels V. M. Fokin and S. I. Perovskiy and Major V. S. Shvetsov performed precise aerobatics. These fighters, of the newest design, flashed over the multitudes of observers. Groups of aircraft headed by planes flown by Lieutenant Colonels N. I. Andriyevskiy, V. Dubina, and L. Kalina carried air-to-surface missiles. An original new craft designed by N. I. Kamov -- a rotating-wing aircraft piloted by D. Ye. Yefremov -- was also demonstrated at the show.

NASA

Heavy transport aircraft and helicopters with turbo-prop engines both landed and air-dropped airborne troops with rocket equipment.

The show clearly demonstrated the growing military might of Soviet aviation and its ability to deal crushing blows against any aggressor.

Our Air Force's flying stock was constantly being reinforced with new equipment. At the same time, in conjunction with the further decrease in the Armed Forces, the size of the Air Force was trimmed down. The cutback in the number of aircraft was to a substantial degree compensated by improvements in their quality, and their increased combat capabilities based on the use of rockets and nuclear armament. /252

In evaluating the qualitative state of our Air Force, defense minister and Marshal of the Soviet Union R. Ya. Malinovskiy on 22 February 1963 said:

"Substantial changes have taken place in our Air Force during the last few years. Obsolete combat aircraft have been completely replaced by modern jet aircraft including supersonic long-range bombers. Our bombers have been replaced by rocket-carrying aircraft capable of flying precise rocket and nuclear strikes against an enemy from great distances without entering into his air defense's zone of operation.

"Our valiant fliers have successfully mastered the new aviation technology. More than 70% of them are first- and second-class pilots. Test launches of rockets against ground targets by various branches of aviation during the past year have achieved 95 to 100% success.

"Our Air Force is always ready to carry out any mission assigned it" [302].

The rapid development of aviation and the steady increase in its combat might would have been unthinkable without the existence of experienced and technically capable cadre. During the post-war years, outstanding aviation commanders have made themselves known in the Air Force. Officers who finished the war as group, flight or crew commanders have become well-known generals. Vital leading positions in the Air Force are being filled by A. I. Babayev, I. I. Borzov, A. Ye. Borovykh, I. D. Gaydayenko, S. D. Gorelov, V. S. Yefimov, S. Ya. Zhukovskiy, A. L. Zadometsev, A. N. Katrich, P. S. Kirsanov, I. N. Kozhedul, P. S. Kutakov, A. A. Mikoyan, A. I. Pokryshkin, I. I. Pstygo and many other pilots who entered the Air Force during or just before the war.

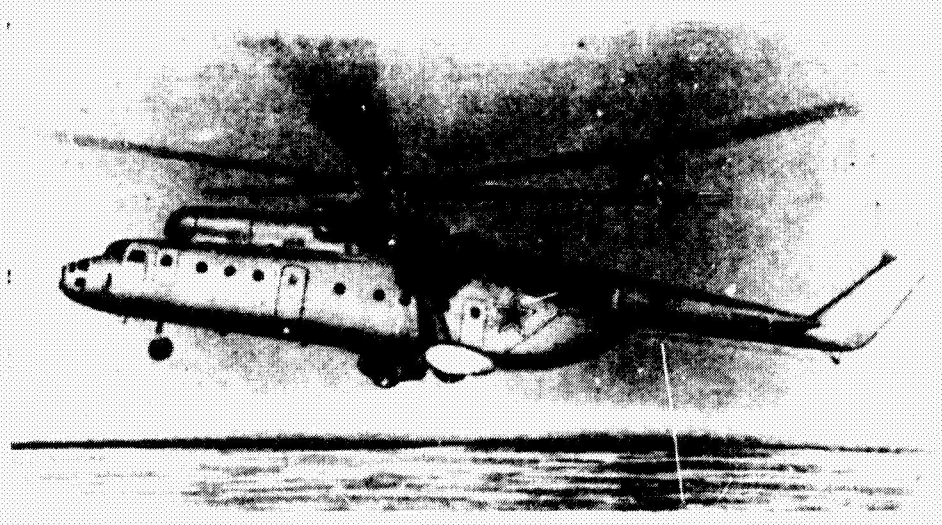
Each year there are new replacements in air units. In 1959, on the basis of a decree by our Party's Central Committee, air institutions were changed to higher educational institutions. Our pilots and navigators with training and engineering who finished the schools now have a deep theoretical background and are capable of handling complex equipment quite successfully and putting their knowledge into practice.

Military aviation has proven to be the basis for training cosmonauts as well. Most of our cosmonauts have graduated from aviation schools and served in Air Force units. The specific character of space flight itself is such that

NASA

it demands knowledge and training which are acquired in aviation. Thus, man's path to space lies in aviation. /253

With the increase in aircraft speeds, views have been altered as well with respect to the nature of the military application of aviation. The combat disposition of aviation commands and units has assumed the tendency toward greater dispersal in space. In the practice of combat training in fighter aviation, problems of intercepting aerial targets have been re-worked. The functions of the leader and the support man in pair formations have changed. Rocket-carrying fighters possess new means of attacking an enemy in the air.



The Mi-6 Helicopter in Flight.

The crews of missile-carrying bombers have been working out means of approaching their objectives without being discovered and firing their missiles by surprise. They fly at low altitudes, which greatly increases the probability of escaping the enemy's air defense. Great attention is given to training crews for flight not only above land but over the sea as well, in addition to the location and destruction of objectives at sea.

Fighter-bombers are constantly perfecting means of hitting small mobile targets going through complex maneuvers. The interaction between air units and the ground troop formations they are supporting is constantly being tightened.

In long-range and military transport aviation, the number of crews with first- or second-class ratings capable of carrying out any assignment under the most difficult conditions is increasing yearly.

All problems of training flight crews are resolved with the observance of necessary steps for maintaining combat readiness of the aviation units and commands. The indisputable demands of consistently high combat readiness are dictated by the fact that under new circumstances, the aggressor would have greater possibilities of unleashing war by surprise. /254

Soviet aviators can never permit the enemy to strike us unawares. They take all steps to maintain high combat readiness.

The very concept of combat readiness itself has substantially broadened. It takes shape out of the combat readiness of equipment as well as that of personnel and their ability to carry out any combat mission. Complex technology demands careful coordinated efforts on the part of a large number of specialists to maintain constant readiness of aircraft and all mechanisms supporting flight.

In practicing combat readiness, fliers are often required to deal with the most varied contingencies. Collection, fast reactions, bold decisions, and at times heroism. Here are a few examples of life in the aviation units.

In the autumn of 1959 a fighter piloted by young A. Aravshatyan took off from the airfield, but the flight lasted only three minutes. On the fourth minute, the engine suddenly died. The plane was at a very low altitude. Under such circumstances, it's easy to lose your head. But the young pilot was able to carry out his piloting task successfully under complex circumstances and landed the machine. The Supreme Command of the Air Force awarded him an engraved watch for bravery and resourcefulness [303].

On 3 November 1962, fighter pilot Captain I. T. Kunitsyn, while on a routine flight, was forced to bail out due to the failure of his equipment. He descended by parachute into a cold sea. Deprived of his on-board rations and fresh water, the pilot swam in the sea for 68 hours in rain and fog. Finally he reached a small nameless island on which his comrades found him. Morale sturdiness and good physical temper helped Kunitsyn to overcome all difficulties. After a short recovery and rest, the pilot once again returned to duty. For bravery and self-possession, manifested under complex circumstances, Captain Kunitsyn was awarded the order of the Red Banner [304].

On the first day of the new year, 1965, the radio reported an order of the Presidium of the Supreme Soviet of the USSR awarding the designation Hero of the Soviet Union to Major Boris Ivanovich Ryabtsev.

On 9 October 1964, Ryabtsev took off for a routine flight. He was to make air tests of a production aircraft, produced by a factory. The test program was coming to an end when the engine suddenly stopped. At this time the aircraft was over a large city. The pilot received the order from the ground to bail out. /255

However, he could not leave an unguided aircraft: the heavy machine could fall on the street or smash into a house. Ryabtsev knowingly put off the moment of jumping, desiring to avoid the city. In these seconds the pilot did not think of himself.

And the aircraft was in fact flying over a dangerous region. Ahead an opened space appeared, it was possible to leave the machine. Ryatbsev bailed out, but it already late: the altitude was too low. He perished saving the lives of people unknown to him [305].

NASA

Pilots are people of a heroic profession. Their lives are great deeds and the motherland values her heroes highly.

The Presidium of the Supreme Soviet of the USSR has established special honorary designations, "Meritorious military flier of the USSR" and "Meritorious military navigator of the USSR". These designations are achieved by the most experienced and expert masters of flight.

On 19 August 1965, the nation recognized the skill of the best fliers and navigators of military aviation. The honorary designation "Meritorious military flier of the USSR" was awarded to 29 fliers. The designation "Meritorious military navigator" was achieved by three navigators.

In 1966 and 1967, the ranks of meritorious aviators increased significantly. In these years an additional 93 generals and officers of the military Air Force were given awards indicating their merit in flight affairs.

The enemies of peace continue to oppose in every way possible an easing of international tension. The Cuban crisis, the events on Cyprus, the civil war in the Congo and the intervention of the USA in Viet Nam -- this is far from a complete list of the events which characterize the aggressive actions of the imperialists. Their military provocations at the borders of the Soviet Union do not cease. American reconnaissance aircraft has tried more than once to penetrate the air space of the USSR and other nations of the socialist camp.

On 1 July 1960, a US military aircraft RB-47 violated the national borders of the USSR in the region of the Kanin Nos Cape. The alarm signal rang in one of the air defense fighter aviation podrazdeleniyes.[1] The experienced pilot, Zveno[2] commander Captain V. A. Polyakov took off to intercept the violator. He quickly discovered the target. The American pilots did not wish to carry out the demand of Captain Polyakov that they land immediately. The pilot opened accurate fire. The violating aircraft was knocked down and fell in the territorial waters of the USSR [306].

Fliers L. Shkarupa and M. Krylov were able to do the same, forcing a violator aircraft to land at one of the airfields of the German Democratic Republic [307]. /256

The fighter pilots of the military Air Forces continue to alertly guard the Soviet sky. In peaceful times they tirelessly bear a heavy, responsible and honorable combat watch. They are always on the alert.

Our aviators deeply understand that the motherland demands from them even greater efforts to raise the combat readiness of the military Air Forces. They are obliged to do this by the decisions of the XXIII Congress of the Communist Party of the Soviet Union. True to their military duty, they carry them out with honor.

Cover Page Title

[1] Podrazdeleniye - a Soviet military unit ordinarily part of a chast'.
[2] Zveno - a unit smaller than a podrazdeleniye.

Soviet aviation, along with other branches of the Armed Forces, is required to defend the peaceful labors of the Soviet people, building the bright structure of communism. The Air Force is equipped with contemporary speed jet aircraft and various helicopters. Thousands of notable masters, first class pilots and navigators, engineers and technicians serve in its ranks.

Piloted aviation has a great future. No matter how great the capabilities of ballistic rockets and pilotless automatic aircraft, only the presence of a man on board the flying apparatus can guarantee the fulfillment of any tasks assigned to the combat means in the near earth space.

The quality of aircraft improves constantly. In strict succession, the tendency for flight speeds to increase continues. And the time is not far off, when aircraft will appear at the airfields capable of exceeding the speed of sound by many times and approaching ballistic rockets in their characteristics.

The capabilities of piloted aviation can greatly increase when aircraft can be applied for takeoff and landing without airfields. Helicopters will not lose their significance in military affairs as a universal means of transport and communication.

Aircraft equipped with air to ground rockets are able to accurately and quickly destroy small and moving objects. They are becoming an irreplaceable combat means in sea theaters.

Fighter aircraft will be able to perform autonomous interception of aerial targets at great distances from the defended objectives. They will be capable of destroying not only piloted but unpiloted means of attack by the aggressor.

In combat situations, only aviation can carry out in full a large complex /257
of reconnaissance missions. Reconnaissance crews can give the most reliable and complete information about enemy objects if they are suitably trained. This information arrives at the interested levels in the shortest possible time. Without aerial reconnaissance it is impossible for all types of armament to act successfully, including rockets.

The role of aerial transport in military affairs grows ever greater. The regrouping of troops, the supply of cargoes, the dropping and landing of airborne troops are unthinkable without participation of transport aircraft.

A new indication of the growing aviation power of the Soviet state was seen in the air parade of 1967, connected with the 50th Anniversary of the Great October Revolution. At the parade at Domodedov, in the presence of the leaders of the Party and government, many observers and foreign guests, the pilots of military and civil aviation and the sportsmen of the DOSAAF demonstrated high mastery and faultless piloting techniques. On a supersonic

NASA

aircraft complex patterns of higher pilotage were accurately performed by Hero of the Soviet Union Colonel V. K. Likhachev. Impetuous fighter pilots V. I. Medvedev, R. Sh. Voskanyan and P. P. Fedoseyev flew beautifully and with coordination, and with their followers they demonstrated stupendously beautiful high group pilotage.

The first observes saw many new things in aviation technology: short landing and takeoff aircraft, new transport and passenger aircraft An-22, Il-62, Tu-134 and Yak-40. Hero of the Soviet Union V. G. Mukhin demonstrated a vertical takeoff aircraft.

Particular interest was aroused by multi-purpose aircraft with variable wing geometry. In flight the pilot has only to reduce the sweep of the wings and the aircraft hovers like a bird. In this case, it has high aerodynamic qualities which are particularly valuable in takeoff and landing, in flying at low altitudes and seeking targets.

The appearance of the machine changes quickly. Only a few seconds passed and the sweep of the wings was increased. The high speed machine quickly accelerates. Now it can fly at speeds much above the speed of sound.

Soviet people marked Air Force Day of the jubilee year 1967 with a feeling of just pride in their nation and their great aviation empire.

Military aviation is in a condition of uninterrupted renewal. Aviation technology improves rapidly. Enormous perspectives for future growth open before the military Air Forces. /258

In his report to the XXIII Congress of the Communist Party of the Soviet Union, the general secretary of the Central Committee, L. I. Brezhnev stated that our Party in the future will give unweakened attention to the question of strengthening the defense power of the Soviet state and will be concerned for the further development of all means of armed combat, including the development of military aviation.

In our days, an extremely daring dream will rapidly become true. A guarantee of this is the spirited labor of the Soviet people, the wise leadership of the Communist Party and its Leninist Central Committee.

NASA

CHAPTER 6

NAVAL AVIATION

ABSTRACT. The technical and organizational history of Soviet Naval Aviation since its founding before the first world war is presented. Particular attention is given to naval air operations during the second world war. Photographs of distinguished pilots are presented.

The Establishment of Soviet Naval Aviation /259

Naval aviation in Russia began to be established on the eve of the First World War. Aviation podrazdeleniyes were first formed in the observation and communications service (SNIS) of the Baltic and Black Sea Fleets. Their equipment was first imported seaplanes, and then from 1914, seaplanes built by D. P. Grigorovich, the flying boats M-5 and M-9.

The possibility of landing on water and remaining afloat with the unsatisfactory reliability of the aviation technology of that time gave seaplanes a powerful advantage over wheeled "dry land" aircraft in flights over water. This circumstance for many years determined the equipment of aviation podrazdeleniyes of the fleet with seaplanes, and the concept "naval aviation" remained for a long time synonymous with seaplanes.

At the very start of the First World War naval aviation was used only for observing the near-shore regions of the sea. But the area of the missions assigned to it increased very rapidly. It began to make systematic reconnaissance of ships in the open sea and of bases and ports of the enemy, to carry out bombing and strafing from the air of ships and short objectives and also to hunt submarines in areas where its own fleet stopped.[1]

Starting in 1915, special aviation transport ships were introduced to the Black Sea and Baltic Fleets, the predecessors of contemporary aircraft carriers. These ships had from six to ten seaplanes onboard, which were lowered from the ship to the water for takeoff and raised to the ship from the water after landing by special hoist apparatus.

[1] Bombing was carried out by individual aircraft using light bombs and aerial firing, as a rule, while performing reconnaissance.

From the spring of 1915, the important combat campaigns of squadrons of /260
the Black Sea Fleet to blockade the Bosporus and Zonguldak corner basin were carried out with the participation of aviation transports. In this, the aircraft performed reconnaissance and carried out simultaneous bombing of shore and port objectives, protected from artillery fire from the sea.

On 6 February 1916, for the first time in the history of aviation, aircraft from aviation transporters were used to strike an independent air blow at the port of Zonguldak. They dropped 18 one pound and 20 ten pound bombs on the port (all together 368 kg), sank a steam ship and several small ships [308]. In 1916 and 1917 several similar independent operations were carried out by aviation transports under the cover of artillery ships and mine layers.

Aircraft began to be used for naval transports. In moving troops by sea from Novorossiysk and Mariupol' to the region of Rize and Trabzon in April - May of 1916, aviation transports were included in the convoys. In the troop landing regions the aircraft made air reconnaissance and provided antisubmarine defense.

In 1916 seaplanes from aviation transports began to be used to suppress enemy aviation at airfields. On 2 July, seaplanes from the aviation transport Orlits of the Baltic Fleet struck a blow at the enemy seaplane aerodrome of Angern[1] and forced the enemy to cease flights from this aerodrome against Russian ships firing on the positions of the enemy.

Thus, in 1915 and 1916 the basic directions of combat utilization of aircraft at sea were determined in their initial form. There were also changes in the organization of naval aviation. In 1916 a naval aviation administration was established in the Ministry of the Navy. Aviation was separated from SNIS and reduced to the air divisions of the Baltic and Black Sea Fleets with direct subordination to the fleet commanders. The air divisions had two brigades each consisting of three divizions[2] each; a divizion consisted of two to three detachments with six aircraft a piece. In the Baltic Air Division one detachment was based on an aviation transport and was called a ship detachment. In the Black Sea Air Division there were three such detachments forming a ship divizion. The combat personnel of an air division included seaplane chast's and aviation detachments of land fighter aircraft for the air defense of the fleet bases, and in the Black Sea division /261
there was also a detachment of dirigibles.

In the beginning of 1917, naval aviation included on the Baltic Sea, 88 aircraft and 45 fliers, on the Black Sea, 152 aircraft and 56 fliers [309].

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[1] A seaplane aerodome on the Island of Angern in Kurlyand at the western edge of the Rizh Inlet.
[2] Divizion - A Soviet military unit which is not the same as a division.
[3] Chast' - a Soviet military unit smaller than a division and larger than a divizion or podrazdeleniye.

After the Great October Socialist Revolution, simultaneously with the founding of the Workers and Peasants Red Fleet, the formation within of chast's of naval aviation began. The basis for this organization was the single Baltic Air Division, since as a result of the occupation of the south of the nation by the troops of Kaizer Germany, the Black Sea Division ceased to exist.

By an order of the chief of the naval general staff of 27 April 1918, the first aviation aggregation of Soviet naval aviation was formed, the Baltic Special Air Brigade consisting of three divizions based on one seaplane divizion in Oranienbaum, a second two detachment seaplane divizion in Samar and a third fighter divizion in Krasnoe Selo.

The difficulties connected with supplying flight personnel for naval aviation and the way they were overcome were basically the same as for supplying the military Air Forces as a whole.

The skeleton of flight cadres for Soviet naval aviation was a group of aviation mechanics who trained at the Khapsalo aerodrome in a special school for naval pilots established in the summer of 1917 by a demand of the seamens' committees of the aviation chast' in the Baltic Air Division. These were revolutionary air warriors. From them a fighter aviation detachment was formed in December of 1917 and sent to the Ukraine for the struggle with Petlurov and the Germans. This detachment worked actively on the orders of the Supreme Commander of the Ukrainian Soviet troops Antonov-Ovseyenko, who remarked on the "exceptionally conscientious work of the Baltic Aviation Detachment" [310].

In the course of the Civil War a struggle developed on the internal bodies of water, and lake and river flotillas were organized; aviation podrazdeleniyes were set up for the flotillas. In 1918 and 1919, in addition to the Baltic Special Aviation Brigade, naval aviation included the air division of the Volga Flotilla (11 aircraft) two detachments of the North Dvina Flotilla (6 aircraft), a detachment of the Caspian-Astrakhan Flotilla (6 aircraft) and /262
a detachment of the Onega Flotilla (5 aircraft) [311].

The small numbers and technical imperfection of naval aviation in the period of the Civil War limited the possibilities of its combat application. But the small number of seaplanes available were used fairly widely, not only for reconnaissance, but also for striking blows from the air at ships and base points of the White Guards Flotillas. Each reconnaissance flight, as a rule, was accompanied by strafing and bombing of the enemy.

The Baltic Air Brigade in 1919 cooperated with troops of the Petrograd front in repulsing the advance of Yudenich and with the ships of the Baltic Fleet in the struggle with the naval forces of the interventionists in the Gulf of Finland on the approach to Kronstadt and Petrograd. In the spring of 1919 the aircraft of the brigade attacked ships and bases of the enemy more than 20 times. A direct hit of an aerial bomb destroyed the English aviation transport Vindictive which took no further part in combat actions.

In the liquidation of the counterrevolutionary rebellion at the forts of Krasnaya Gorka and Seraya Loshad', aircraft of the Baltic Air Brigade took part

together with aircraft of the Petrograd front according to an overall plan, on 14 June, the day before the storming of the Krasnaya Gorka Fort, dropping leaflet appeals on the territory of the rebels and also striking a bombing blow, dropping 14 two-pood bombs and firing about 7,000 rounds of aviation ammunition.

In 1920, after the rout of Denikin and the breakthrough of our troops to the Black Sea shore, the Black Sea and Azovc forces were established, including an aviation detachment of 14 seaplanes. The Black Sea fliers successfully struggled with the Vrangel ships and assured the defense of the shore from sea landings and artillery bombardment.

The aviation detachments of the river and lake flotillas participated actively in the Civil War. Seaplanes were utilized for action against White Guards ships and enemy objectives on the field of battle in the interests of the troops with whom our flotillas cooperated. Thus, in 1918, in the battle for Kazan' on 9 and 10 September, the Vrangel military flotilla gave great help to our troops, including the aviation detachment commanded by S. Ye. Stolyarskii, whose pilot systematically bombarded the enemy position and made several flights per day.

As a whole, naval aviation provided powerful cooperation for our ground troops and fleet in the destruction of Yudenich and Vrangel', and also the White Guards Flotillas on the Volga and Kama Rivers, on the northern Dvina and on Lake Onega. The pilots of naval aviation made over 2,000 flights in the period of the Civil War and dropped 34,720 kg of bombs on the enemy, which was approximately a third of the total bomb weight dropped by the pilots of all Soviet aviation. /263

In 1920, naval aviation was removed from the navy and subordinated to the main administration of the Workers and Peasants Red Air Force.

At the end of the Civil War, naval aviation included several tens of obsolete worn out aircraft.[1] In fulfilling the task assigned by the Party to construct a powerful Air Force it was necessary to reestablish naval aviation. This was done in the 20's and 30's.

Naval aviation moved simultaneously with dry land aviation to a common form of organizational structure.

In the Baltic and Black Seas military air forces were set up corresponding in organization to the military air forces of military districts. At the end of the 20's, the military air forces of the Baltic and Black Seas included one aviation brigade and three independent aviation squadrons each. For their equipment, several tens of seaplanes had been bought abroad. Simultaneously, there was a wide development of experimental seaplane construction. In 1922,

[1] On 1 October 1923, naval aviation included all together 36 seaplanes[312].

D. P. Grigorovich constructed the three place flying boat M-24. In the period from 1927 to 1936, a special Design Bureau for Naval Aircraft Construction built the flying boats ROM-1 and ROM-2 (open sea scouts); the Design Bureau of A. N. Tupolev built the two-motor flying boat MDR-2 (long-range sea scout); the six-motor twin float seaplane MK-1 (sea cruiser), the four-motor flying boat MTB-2 (heavy sea bomber); designer G. M. Beriev built the single-engine flying boat MBR-2 (short-range sea scout) and designer I. G. Chetverikov built the two-motor multi-purpose flying boat Che-2. The aircraft R-5, TB-1 and R-6 were put on pontoons.

The successes attained in the 30's in aircraft and motor construction insured the reliability of operation of aviation technology in the air and made /264
possible the wide application of ordinary dry land aircraft in flights over the sea. In the second half of the 30's, the combat units of naval aviation began to receive dry land aircraft, not only fighters as before, but also bombers.

Simultaneously, special means for destroying naval objectives were developed: armored and armor piercing incendiary bombs, antisubmarine depth bombs, aviation mines and aviation torpedoes.

The years of the 30's were a time of significant quantitative growth for naval aviation. Already at the beginning of this period, the military air forces of the Baltic and Black Seas had been brought up to two aviation brigades and several independent squadrons on each sea. With the organization of the Pacific Fleet (1932) military air forces were also established in the far eastern sea theater. After the formation of the North Fleet (1933) an aviation squadron of MBR-2's was formed in the north.

The combat training of aviation chast's was directed toward mastery of newly arriving aircraft, equipment and technical armament, the perfection of flight mastery, the development of long-range flights in the open sea, bombing of maneuvering ships and so forth. There was particularly intensive and successful combat preparation in the military air forces of the Black Sea, which was led by Chief V. K. Lavrov and komissar S. F. Zhavoronkov. In 1931, in the military air forces of the Black Sea a detachment of specially armed R-5 aircraft was organized for the mastery of torpedo launching. After the R-5 aircraft, TB-1, TB-3 and DB-3 aircraft were armed as mine and torpedo carriers in special (naval) modification.

The pilots of naval aviation were drawn to the first mastery of the Arctic and North Sea routes. In 1924 and 1925 the Baltic pilot B. G. Zhukhnovskiy made the first flights for ice reconnaissance near Novaya Zemlya and in the Karsk Sea. In 1928, the Black Sea flier A. A. Volynskiy studied the conditions of flight in the at that time completely unassimilated regions of the shores of the Okhotsk and Eastern Siberian Seas. The staffing for aviation on the northern sea routes (polar aviation, as it later came to be called) naval pilots were primarily assigned.

From 1931 to 1935, in connection with the qualitative and quantitative growth of aviation and its means of destruction, there was a differentiation of

the previously uniform multi-purpose naval aviation. It was divided into basic types of aviation. reconnaissance with seaplanes and bomber with seaplanes and partially with wheeled aircraft. Torpedo planes, which were still few, were included in the formations of bomber chast's /265

The development of aviation and its operational-tactical power and the growing significance of the aviation factory in war at sea brought with them a change in the place of naval aviation in the system of the Armed Forces.

In 1935, the aggregations and chast's of naval aviation were separated from the formations of the Air Force of the Workers and Peasants Red Army and included in the Naval Forces of the Workers and Peasants Red Army. The chief of the Air Force of the Workers and Peasant Red Army retained a number of functions in the direction of special aviation questions. Under the control of the Chief of Military Naval Forces of the Workers and Peasants Red Army an aviation section was formed headed by the Deputy Commander of the Military Naval Forces for Aviation.

With the formation on 1 January 1938 of the Peoples' Commissariat for the Military Naval Fleet, the position of naval aviation was finally determined as one of the component elements of the Soviet Fleet. Naval aviation began to be called the aviation of the Military Naval Fleet (the Military Air Force of the Military Naval Fleet). In the Peoples' Commissariat for the Military Naval Fleet an administration for aviation of the Military Naval Fleet was formed. S. F. Zhavoronkov was assigned to head the aviation of the Military Naval Fleet.

In 1938 to 1940, the Peoples' Commissariat of the Military Naval Fleet took measures for the further development of naval aviation. The aviation of the Baltic, Black Sea and Pacific Fleets was strengthened. In the North Sea, the squadron of seaplanes was developed into a regiment and another regiment of fighters and a squadron of bombers SB aircraft were formed.

A characteristic of this period was the saturation of the aviation of the Military Naval Fleet with "dry land" aircraft. The seaplane lost its exclusiveness. The aviation of the Military Naval Fleet was equipped with aircraft specially armed for it, in particular DB-3 aircraft with the modification to carry torpedoes. In 1939 and 1940 a new type of aviation of the Military Naval Fleet was separated from bomber aviation, mine-torpedo aviation, intended to destory enemy ships with torpedoes and for mine laying. The aircraft of the mine-torpedo aviation also had bombing equipment and could be used as bombers.

In combat training, particularly attention was paid to the development of interaction of the aviation aggregates with formations of surface ships and submarines, training for long flights over the open sea and the bombing of moving (maneuvering) targets, including practical bombing on line ships of our fleet, performing the function of ship targets.

In 1938 and 1940, the aviation of the Military Naval Fleet received combat experience. The aviation of the Pacific Ocean Fleet took part in the /266

rout of Japanese troops at Khasan Lake, together with the aviation of the Independent Red Banner Far Eastern Army. The aviation of the Red Banner Baltic Fleet, at the time of the armed conflict with Finland in the winter of 1939/40, provided reconnaissance support for the blockading actions of the fleet, conducted systematic bombing of the enemy ports and laid mines from aircraft in ice waterways. It suppressed the shore batteries of the enemy on the Islands of Koyvisto and Torsari and cooperated with the troops of the Seventh Army storming the Mannerheim line. Naval aviation was also widely drawn in to the bombing of objectives in the enemy rear, communications centers and airfields. The aviation of the Red Banner Baltic Fleet in the winter of 1939/40 made more than 16,000 combat aircraft flights.

V. I. Rakov

The flight personnel of the Red Banner Baltic Fleet aviation demonstrated high combat qualities. The Baltic aviators gave many examples of unlimited dedication to the motherland, bravery, heroism and self-sacrifice. Fourteen Baltic pilots were awarded the designation Hero of the Soviet Union, including Squadron Commanders V. I. Rakov, I. G. Romanenko and N. A. Tokarev, subsequently famous aviation generals.

Simultaneously, combat actions revealed serious inadequacies in the organization of combat service, technical equipment of aviation chast's and the condition of the aircraft stock. Work on eliminating these defects, mastering the experience of Baltic aviation and learning the character of combat activities for aviation in naval theaters in the world war which was beginning were the basic content of organization measures, construction and combat training for military naval fleet aviation on the eve of the Second World War. However, at the start of the war this work was not completed.

Great attention was paid in the pre-war years to the theoretical development of the problem of applying aviation in war at sea. Military naval theory /267
established that the technical achievements in the development of aviation and its combat means would make aviation one of the decisive forces at sea, particularly in limited naval theaters. But independent operational knowledge in war at sea was possessed only for the heavy bombing aviation of the Supreme Command. It was recommended that air operations, both with the fleet and independently, be carried out at sea. Naval aviation was diverted to a more modest role in the aviation support of ship aggregations.

The basic power of the Military Naval Fleet was previously considered to be powerful armored artillery ships, first of all battleships. The Military Naval Fleet aviation had to coordinate its armament with this powerful force and ensure their combat readiness, forming an active means of antiaircraft

defense for the ships at sea and military naval bases, one of the elements of antisubmarine defense and the basic means of reconnaissance at sea. These theoretical positions were reflected in the basic regulation documents for the Military Naval Fleet and in the practice of aviation construction, in the organization and structure of Military Naval Fleet aviation.

On the 22 of June 1941, the combat aviation of the Military Naval Fleet was predominately reconnaissance aircraft and fighters. Torpedo carriers were 9.7%, bombers were 14%, fighters were 45.3% and reconnaissance seaplanes were 25% of the combat equipment.[1]

The aircraft stock consisted, with small exceptions, of obsolete types of aircraft. The conversion to new aircraft had only begun. In the mine torpedo aviation there were torpedo bombers type DB-3 and DB-3f; in the bomber aircraft there were SB, TB-1, TB-3 and a few Pe-2 aircraft; fighter aviation was equipped basically with I-15bis, I-16, I-153 aircraft and had altogether 72 new aircraft Yak-1, Mig-1 and Mig-3; the seaplane stock consisted basically of MBR-2 and a few Che-2.

At the start of the war, in the active fleets, Military Naval Aviation had 1,445 combat aircraft. The North Fleet had two aviation regiments and an independent squadron (114 aircraft altogether: 49 fighters, 11 SB bombers and 54 seaplanes), the Baltic had three aviation brigades, two independent aviation regiments and seven independent aviation squadrons (707 combat aircraft altogether: 188 torpedo carriers and bombers, 368 fighters and 151 reconnaissance seaplanes), and the Black Sea had two aviation brigades, two independent aviation regiments, 13 independent aviation squadrons and two aviation detachments (624 combat aircraft altogether: 138 torpedo carriers and bombers, 346 fighters and 140 seaplanes) [313]. /268

The combat capabilities of Military Naval Fleet aviation were on the whole fairly high. More than 50% of the crews had over two years flight experience and about 50% of the bomber pilots and more than 50% of the reconnaissance aviation pilots were trained for night action; the leading crews of the mine-torpedo and bomber aviation had trained in action against moving naval targets.

Into a Difficult Time

In the first period of the war, in connection with the serious situation at the front, Military Naval Fleet aviation was used to significant degree over dry land, acting against objectives on the front; combat activities at sea were limited to carrying out systematic reconnaissance, striking occasional blows at the communications and bases of the enemy and ensuring the defensive base of the fleet and communications.

In all the defensive operations of 1941 and 1942, carried out by our

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[1] TsGA VMF [Central State Archives of the Military Naval Fleet], f. 864, op. 1, d. 172, p. 87. The remaining 6% were special purpose and auxiliary aircraft.

troops near the sea, naval aviation was used to support the troops together with front aviation. Already by July-August of 1941, not only the bombers and attack bombers of naval aviation, but the torpedo carriers and reconnaissance seaplanes as bombers had been redirected basically to action against ground troops and enemy technology.

The Military Naval Fleet aviation, whose crews, torpedo carriers, bombers and reconnaissance men had not trained specially in the pre-war period for action on ground fronts, became in 1941 factually front aviation.

Together with front and long-range aviation, naval aviation took part in the struggle with the enemies of the military Air Forces, in deflecting the attacks of the fascist invaders.

In the fire of the severe struggles of the Second World War, naval pilots carried out their combat missions valiantly and with high activity.

The aviation of the North Fleet (Commanding General A. A. Kuznetsov, from January of 1943 General A. Kh. Andreyev) was used at the start of the war, primarily in the support of troops beating off the enemy attack on Murmansk. The few pilots of the North Sea Aviation had to act with the greatest effort of their forces. Daily, there were 20 flights of bombers, seaplanes and /269
fighters in groups of three to seven aircraft and even by individual crews. About 2,500 aircraft flights were made by North Fleet Aviation in support of the troops. After the stabilization of the front, its basic forces were concentrated on the defense of the fleet base and sea communications, which were especially significant in the North Sea Theater, all military and civilian economy transport in the polar region was conducted at that time only by sea.

In connection with the great strategic significance of the North Sea Theater, the aviation of the North Fleet was significantly strengthened in 1941 and 1942.

In July of 1941, a squadron of SB aircraft was transferred from the Red Banner Baltic Fleet, at the end of 1941 a fighter regiment with "hurricane" aircraft was formed, and in January of 1942 a regiment of Pe-3 aircraft was transferred from front aviation. The North Fleet Aviation also included aircraft of polar aviation. In addition, during the first year of the war five aviation regiments from the aviation reserve of the Military Naval Fleet were transferred to the North Fleet. Starting in 1942, in spite of losses, the aircraft stock was maintained at a level of 280 to 300 combat aircraft by systematic replacements.

The great operational mission of the North Fleet Aviation was the defense of allied convoys coming from England to our northern ports of Murmansk and Arkhangel'sk and returning from these ports to English ports. In the first period of the war 20 such convoys arrived and 16 were sunk. The convoys were secured by blows at the airfields and bases of the enemy, and also by fighter patrols when the convoys were in the operational zone of our fleets.

Securing the passage of each allied convoy demanded tremendous efforts of

their forces from our pilots. Thus, in the interests of English convoy PQ-16, consisting of 34 transports, 19 protective surface ships and two submarines, arriving at Murmansk in May of 1942, our pilots made 1,010 aircraft flights, including 130 to strike enemy airfields, 730 to guard the ports and 250 for reconnaissance and fighter security to the convoy in the fleet zone [314]. The passage of such a convoy sharply reduced or even cut off the combat activities of aviation for performing other missions.

By a directive from headquarters in the summer of 1942, aviation chast's from the Karel'sk front, the Arkhangel'sk Military District and long-range aviation aggregations, which came under the operational control of the commandant of aviation for the North Fleet when word was received of the departure of a convoy from the English ports, were drawn in the security efforts for convoys. /270

The North Fleet Aviation in the first period of the war could not develop a wide influence on the sea communications of the enemy. There was not enough force for this. Only at the middle of 1942, when the aviation received torpedo carriers, could it be included in fleet operations against enemy communications. The bombers and torpedo carriers of the North Fleet in the first period of the war destroyed four transports and damaged several.

P. G. Sgibnev

Squadron Commander Captain B. F. Safonov especially distinguished himself in the air battles of the first period of the Second World War at the North Sea Theater. On 13 September 1941 his group consisting of seven I-16 aircraft and two Mig-3's beat off an attack by 27 enemy aircraft against fleet objectives in the Kol'sk Bay, knocking down nine enemy aircraft without losing one of their own [315]. On 15 April 1942, 13 fighters headed by Safonov went into battle near Murmansk with a group of 18 Ju-87 and 17 fighters. The North Sea /271

pilots knocked down eight Ju-87's and one Me-110, losing one Mig-3 [316]. The Deputy P. G. Sgibnev, pilots N. A. Bokiy, S. G. Kurzenkov, Z. A. Sorokin, A. M. Titov and others were comparable to the commander, and became masters of air battle, calling themselves Safonov's men with pride.

B. F. Safonov himself, who later became the commander of a fighter aviation regiment, destroyed about 30 enemy aircraft in 11 months of the war. He was the first pilot to receive two gold stars of a Hero of the Soviet Union in the struggle with the fascists. The regiment which he commanded has been honored with the name of B. F. Safonov, who perished heroically on the 30th of May 1942 in the air battle over the Barents Sea.

The aviation of the Red Banner Baltic Fleet (commanded by General V. V. Yermachenkov, from 15 July 1941, General M. I. Samokhin) supported our troops and struck against enemy airfields, troops and technology, tanks and motorized columns in the deep operational zone during the period of the defensive struggle near the Baltic.

Bombers and dive bombers were frequently forced to act without fighter cover, breaking through to the assigned targets through powerful enemy anti-aircraft defense. True to their military duty, the Baltic pilots gave an example of combat bravery and self-sacrifice. On 30 June 1941, in a strike at a mechanized column of the enemy approaching the Western Dvine in the region of Yekabiils, the DB-3 aircraft of Junior Lieutenant P. S. Igashev was attached by three fascist fighters and set afire. In the flaming bomber, Igashev rammed an enemy fighter and plunged into the enemy tank column [317]. This heroic feat was also performed by pilot P. P. Ponomarev, who slashed his way on a flaming aircraft into a group of tanks and tracted vehicles on a pontoon bridge across the Western Dvine.

The military fighter pilots conducted extremely severe aerial battles. Frequently, running out of ammunition in battle, they rammed their enemies. Thus, on the 16th of July Senior Lieutenant N. I. Mitin rammed a PZL-24, on 18 July Lieutenant V. A. Mikhalev rammed a Khe-126, on 19 July Senior Lieutenant M. I. Bagryantsev rammed a Ju-88, on 22 July Senior Lieutenant D. I. Zosimov rammed a Ju-88, on 24 July Senior Lieutenant I. I. Martyshchenko rammed a Ju-88 and Captain P. A. Brin'ko rammed a Me-110.

High combat activity was displayed by the fighter pilots of the aviation group commanded by Captain L. G. Belousov and Captain A. K. Antonenko in the /272
time of the heroic 102 day defense of the Khanko Military Naval Base. They served in the antiaircraft defense of the base, conducted reconnaissance, dive bombed enemy troops, successively acted against enemy ships, -- in a word, they were an effective active defense force. This group numbering 22 aircraft in all accounted for 44 destroyed enemy aircraft and about 20 sunk small boats and launches.

In the first weeks of the war, until our troops left the near Baltic regions, the aviation of the Red Banner Baltic Fleet participated actively over the sea, cooperating with ships. The mine torpedo aviation conducted mine laying in the ice channels in the centers of naval communication, which

L. G. Belousov

continued there after over the course of the entire war. The first bank of 21 mines was layed by aircraft on the approaches to Turku on the 28th of July 1941.

The Red Banner Baltic Fleet Aviation was also involved in striking blows at the administrative political centers of the enemy. In August of 1941, while the enemy occupied almost all of the Baltic region and was fighting toward Luga, by an order of the headquarters of the Supreme Commander, the attacks of the fascist aviation on Moscow were answered by air blows at Berlin, made by a special aviation group consisting of two squadrons of DB-3 from the Red Banner Baltic Fleet Aviation and two squadrons of long-range bomber aviation under the overall command of the Chief of the Military Air Forces of the Military Naval Fleet, Lieutenant General of Aviation S. F. Zhavoronkov. The podrazdeleniyes of Baltic Aviation were commanded by Colonel Ye. N. Preobrazhenskiy, and the podrazdeleniyes of long-range bomber aviation were commanded by Major V. I. Shchelkunov.

The attacks on Berlin were made from the airfields at Kagul and Aste on the Island of Saarema. The distance to Berlin along the path travelled, passing mostly over the sea, was about 1,000 kilometers. In DB-3 aircraft, the flight to the target the bombing and return took seven to eight hours of flight time.

On the night of 7 August, the Baltic pilots made the first attack on Berlin, in which 15 aircraft participated [318]. The appearance of our aircraft over Berlin astonished the fascists. They perferred to ascribe the attack to the English. The communication was as follows: "English aviation bombed Berlin. There are killed and wounded. Six English aircraft shot down..." England replied in its radio announcements that the communication was interesting and puzzling, since English aviation made no flights against Berlin on the 7 and 8 of August. /273

Up to 4 September, the group of Colonel Preobrazhenskiy made 86 aircraft flights, including 33 on Berlin and the remainder on reserve targers: Menel, Danzig, Kolberg. A somewhat smaller number of flights was made by the long-range bomber aviation group of Major V. I. Shchelkunov.

The attacks on Berlin revealed the lying assurances of the fascist propaganda about the rout and annihilation of Soviet aviation and served as their own kind of warning about future retribution.

This honorable mission, to strike in 1941 the first blows of the war by Soviet aviation against the fascist capital, was successfully performed by the pilots of the Red Banner Baltic Fleet and the long-range bomber aviation. /274

In the attacks on Berlin, one aircraft was lost altogether. The crews performing this mission were decorated with orders, and the particularly outstanding Baltic pilots Ye. N. Preobrazhenskiy, V. A. Grechishnikov, A. Ya. Yefremov, M. N. Plotkin and navigator P. I. Khokhlov were awarded the high designation Hero of the Soviet Union.

A Group of Pilots from the Volga River Flotilla.

M-9 Seaplane.

Award of the Guards Banner to the Personne' of the Second Guards Fighter Aviation Regiment. The Guards Oath is Given by the Regimental Commander P. F. Safanov (North Fleet, May 1942).

Commander of the First Mine Torpedo Aviation Regiment Colonel Ye. N. Preobrashenskiy (left) and Navigator Major P. I. Khokhlov before the Flight to Berlin. August 1941.

M. Ye. Yanko

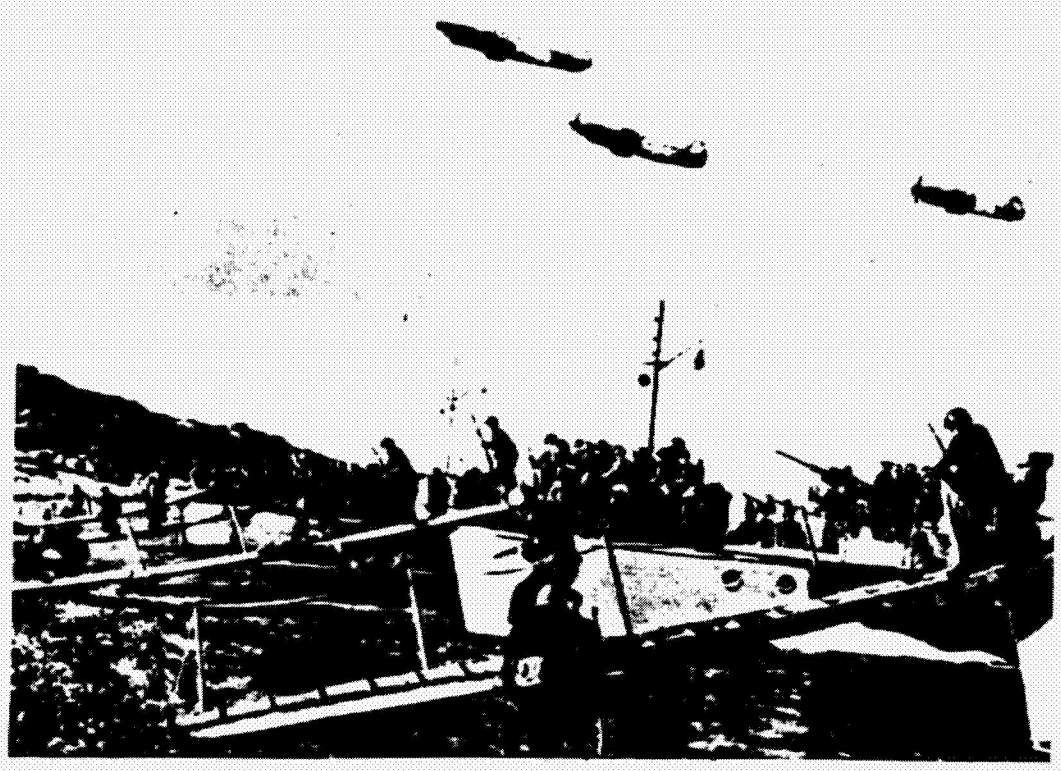
Enemy aviation tried to destroy our aviation podrazdeleniyes at the airfields of Kagul and Aste by day and night blows from the air, but was unable to carry out this mission. Only after a landing was made on the Island of Saarema were the blows at Berlin from the DB-3 aircraft of naval aviation cut off.

During the defense of Leningrad, the aviation of the Red Banner Baltic Fleet acted together with the Military Air Forces of the Leningrad front and carried out the mission of front aviation. Fighter aviation of the fleet was included in the antiaircraft defense system of Leningrad-Kronshtadt.

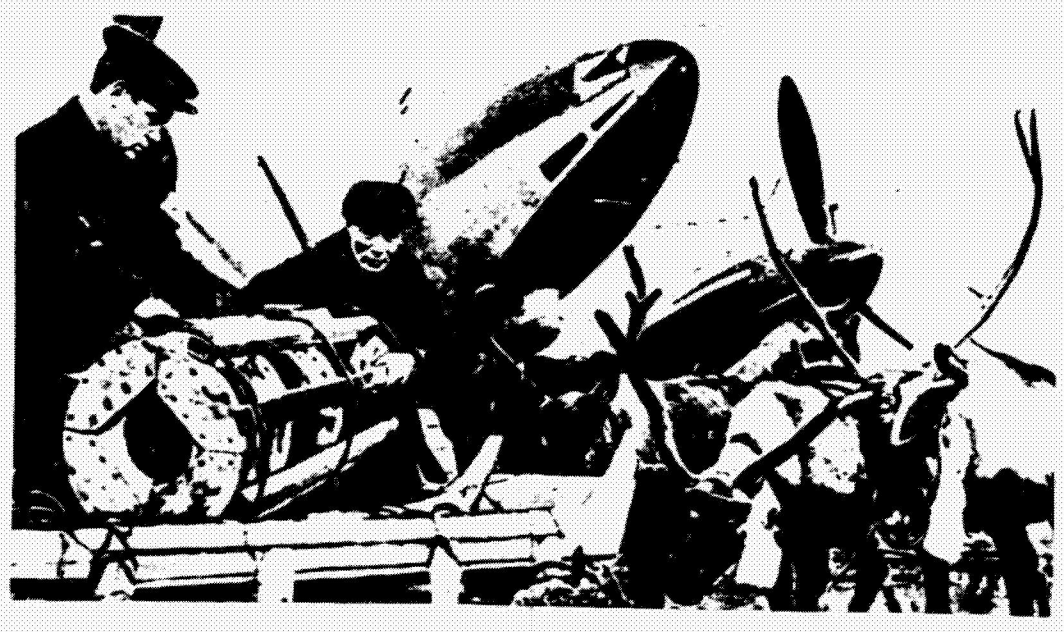
In turning back the enemy attempt to capture the city by storm in September 1f 1941, naval aviation struck blows at enemy objectives on the field of battle day and night. Every aircraft that was in condition to fly made several flights per day. Many tens of /275
tanks, trucks and artillery were annihilated or put out of commission by the attack bombing blows of the Baltic pilots. Naval pilots A. A. Karasev, A. Ye. Mazurenko, M. N. Khrolenko, N. G. Stepanyan and many others showed themselves true masters of attack bombing blows on the battlefield. Baltic aviation made no small contribution to the support of the troops turning back the September advance of the enemy.

The Feat of M. Ye. Yanko in a Drawing by the Artist K. Akkuratov.

A significant contribution to turning back the mass attack flights of fascist aviation on Leningrad in September 1f 1941 was made by the Baltic fighters. They went self-sacrificingly into battle with the overwhelming forces of the enemy. In these battles, high tactical mastery was demonstrated by V. F. Golubev, N. Ya. Vasil'yev, P. P. Kozhanov, A. Yu. Baysultanov, A. A. Mironenko, G. D. Tsokolayev, N. P. Tsygankov and many other pilots of the Red Banner Baltic Fleet Fighter Aviation.



Soviet Fighters Cover the Landing of Marines at Petsamo. 1944.



Preparation of Aerial Bombs for Loading on the Aircraft at One of the Polar Airfields. 1944.

P. A. Brin'ko (left) Tells His Comrades about Encountering a Fascist Vulture in the Sky over the Island of Khanko, August 1941.

A. Yu. Baysultanov

N. G. Stepanyan

In the September air battles, four victories were scored by Hero of the Soviet Union Captain P. A. Brin'ko, knocking down 15 enemy aircraft in two and a half months of the war. On 14 September Captain P. K. Brin'ko perished in aerial battle. One of the streets of Leningrad has been named after this fearless pilot.

In November of 1941, a portion of the forces of Red Banner Baltic Fleet Aviation were assigned to support the troops battling near Tikhvin. With active combat work and sniper blows at enemy troops the naval pilots cooperated in destroying the Tikhvin grouping of the enemy.

G. L. Tsokoleyev

In the air battles near Leningrad, the Baltic pilots showed many examples of tactical mastery and outstanding combat training. Thus, on 16 March 1942, a group of six fighters commanded by Hero of the Soviet Union G. D. Tsokoleyev intercepted an enemy group of 15 bombers and eight fighters. In the course of a 25 minute battle, our pilots destroyed six bombers and three fighters. The fascist air /276
pirates dropped their bombs on their own troops. Similar cases are not rare.

A particular place in the activities of the Red Banner Baltic Fleet Aviation is occupied by the cover of the road of life, the only communication connecting Leningrad with the nation in the period of blockade across Lake Ladoga: in winter by trucks on the ice, and in the summer by ship navigation.

For the cover of the Ladoga track, a special aviation group was assigned from naval aviation consisting of two fighter aviation regiments and an independent squadron,[319] based at the new Ladoga Airfield complex. A portion of the fighter strength of the military Air Forces of the Leningrad front was also assigned to cover this tract. Fascist aviation undertook desperate efforts to break the communication of Leningrad with the nation. Extremely severe air battles developed over Lake Ladoga, taking on the character of aerial struggles over many days at the time of increased movement on the ice road.

In 1941 and 1942 naval aviation made more than 8,000 aircraft flights to cover the road of life. The aviators of the Red Banner Baltic Fleet and the Leningrad front conducted 203 aerial battles and knocked down about 100 enemy aircraft [320].

Being assured of the futility of his attempt to break our Ladoga communications by aerial blows, the enemy attempted a landing operation on the Island of Sukho, a key position on the approach to New Ladoga. At dawn on 22 October 1942, a landing force of 16 ferry boats, seven landing craft and 13 launches approached the Island. The artillery battery on the Island put up a brave resistance, sinking two landing ferry boats, but it was quickly suppressed by the fire of the enemy ships and the enemy began to land troops.

The chast's of Red Banner Baltic Fleet Aviation which had risen to beat off the attack smashed the head of the landing detachment, sunk and put out of action eight landing ferry boats and two launches and put the enemy to flight. Our fighters knocked down 14 aircraft of the air cover for the landing [321].

The aviation of the Black Sea Fleet (commanded by General V. A. Rusakov, from October 1941 by General N. A. Ostryakov, from April of 1942 General V. V. Yermachenkov) began its combat actions with bombing blows at the Rumanian ports and military naval bases. From 23 June to 22 July 1941, over 600 aircraft flights were made against military objectives in Bucharest, Constantsa, Sulina and Tulcha.

Bomber aviation made systematic attacks on the oil industrial region of Ploesti. The attacks were made by small groups of three to six DB-3 aircraft and Pe-2 aircraft by day and by single DB-3 aircraft by night. From 1 July to 18 August 1941, about 100 aircraft attacks were made on Ploesti. /277

The flights on Ploesti, in which aircraft of long-range bomber aviation participated together with the bombers of the Black Sea Fleet, alarmed the German High Command. Hitler, in his general note of 22 August 1941, noted the serious danger of the destruction of Ploesti by Soviet aviation and ordered that "The fastest possible liquidation of the Russian military air bases on the borders of the Black Sea, particularly in the region of Odessa and in the Crimea has a decisive value for Germany", since the destruction by Soviet aviation of the oil industry and Rumania "could have such results for the continuation of the war as would be difficult to predict..."[322]

In connection with the worsening position on the front, by a decision of the Military Council of the southern front of 20 July 1941, the bomber aviation of the Black Sea Fleet was reassigned to action against the advancing troops of the enemy. In August, four flights altogether were made against Ploesti, in which a total of 25 DB-3 aircraft participated.

From then on the basic nature of the combat activities of the Black Sea Fleet Aviation was cooperation with the troops and the fleet defending Odessa and Sevastopol', and later on the Caucasus.

Thirty five fighters and six attack bombers were assigned from the aviation of the Black Sea Fleet to the aviation group of the Military Air Forces, providing the defense of Odessa. In addition, all bombers, attack bombers and a part of the fighter aviation of the Black Sea Fleet supported the troops defending Odessa from Crimean airfields.

Naval aviation made 4,641 aircraft flights in support of the defense of Odessa [323]. Systematically striking attack bombing blows at the troops of the enemy and his airfields, they annihilated up to 80 enemy aircraft.[324] The active combat acitivities of the Black Sea Fleet Aviation helped to a significant degree to attain the goal of the defense. The Black Sea Fleet Aviation also successfully secured the evacuation of troops from Odessa: on the night of 15 October 1941, blows were struck at enemy airfields and troops in the front lines, and in the daytime an attempt of enemy aviation to attack the troop transports and ships was beaten off. Covering the convoy, the Black Sea fighters broke up an attack of 50 enemy bombers, of which 17 were destroyed. /278 Pilots I. P. Belozerov, P. V. Moskalenko and others particularly distinguished themselves in the battle for Odessa and were subsequently awarded the designation Hero of the Soviet Union.

Direct cooperation from the air with the troops defending Sevastopol' was provided by a specially established aviation group of the Sevastopol' defense region (SOR). The aviation group of the SOR of the Black Sea Fleet Aviation was based at two airfields and one seaplane air base. Its combat forces included up to June of 1942, 30 to 40 fighters, 15 to 30 bombers and attack bombers and 20 to 30 seaplanes, and up to 25 June at one remaining airfield 17 fighters and eight attack bombers. The remaining aviation forces of the Black Sea Fleet acted from airfields on the Caucasus shores.

The aviation group of the SOR conducted combat activities under conditions of overwhelming enemy aviation numerical superiority (the enemy had about 150 to 180 fighters and 430 to 450 bombers directed at Sevastopol'). The pilots of the aviation group made several flights daily, compensating for the lack of combat forces with the greatest possible tension of physical forces. The combat activities were conducted from airfields which were more than once subjected to blows by enemy aviation, and lasted up to the last day of the defense of Sevastopol' even under artillery fire.[1]

Having a superiority in fighters, the Hitlerists more than once attempted to block the Sevastopol' airfield complex, in particular the basic airfield of Khersones. The enemy fighters patrolled over the airfield and when our aircraft took off they called additional fighter groups into the air. And in spite of this, the Black Sea pilots conducted active combat operations to the last days of the defense.

The Pe-2 dive bombers bombed enemy command points and accumulations of his troops. The attack bombers attacked troops, fire points and combat technology of the enemy. In December of 1941, the attack bomber aviation destroyed a column of the enemy's 72nd Infantry Division. Aerial reconnaissance discovered it on the road from Baydary to Varnutka on the road to the Sevastopol' area of the front. From Varnutka to Sevastopol', the column followed the only road, cut through a canyon. A squadron of attack bombers, commanded by F. N. Turgenev struck blows at the head of the column and blocked its movement in the canyon, and then completed the destruction of the accumulated enemy troops and technology.

With supreme courage and bravery, the fighter pilots struggled with enemy aviation. High combat activity, mastery and tactical ability were shown by the commanders of the fighter podrazdeleniyes, M. V. Avdeyev, K. S. Alekseyev, F. F. Gerasimov, K. D. Denisov, N. A. Naumov and many others. Running out of ammunition in battle, pilots Ye. M. Ryzhov, S. Ye. Karasev, N. I. Savva and Ya. M. Ivanov rammed enemy aircraft. More than 330 enemy aircraft were annihilated in the air battles and on the airfields in the defense of the city city [325]. /279

At the time of one of the enemy air attacks on Sevastopol', in April of

[1] At the time of the third storming, as a result of enemy air bombardment and artillery fire 30 aircraft were destroyed and 86 were damaged on the airfields of the SOR. (Archives of the Historical Section of the Military Naval Fleet, Sec. 1627, p. 15).

1942, the commander of the Black Sea Fleet Aviation, Hero of the Soviet Union Major General of Aviation N. A. Ostryakov, a talented military leader, perished.

N. A. Ostryakov

Aviation made no small contribution to the defense of the heroic city. 5735 aircraft flights were made by the pilots of the Black Sea Aviation during the defense of Sevastopol' against enemy troops and technology on the dry land front alone [326].

From the summer of 1942, the Black Sea Fleet Aviation carried out the mission of supporting the troops defending the Caucasus. In cooperation with the Fifth Air Army, Black Sea Aviation actively supported the 18th and 47th Armies and the Black Sea Fleet Marines in the defensive struggle in the North Caucases and on the approaches to Novorossiysk and Tuapse.

In all naval theaters, from the first days of the war, there was a stubborn battle for mastery in the air. Naval aviation, in cooperation with front aviation and long-range aviation, systematically struck blows at enemy airfields. Fascist aviation made attacks on the bases of our fleet, on naval ports, communications and airfields. Over these objectives severe air battles /280
took place. The mission of defending its fleet bases was one of the most important for the Naval Military Fleet aviation, and it fulfilled it valiantly. In the air battles and on the airfields fascist aviation lost about 2,800 aircraft [327].

The Military Naval Fleet Aviation bore the harsh experiences of the first period of the war with honor. It made a substantial contribution to the business of supporting troops in defensive battles near the seas, in the defense of military naval bases and ports. A great role was played by the Military Naval Fleet Aviation in the defense of Murmansk, Leningrad, Odessa and Sevastopol'.

The combat losses of Military Naval Fleet Aviation were also significant. Only a portion of the losses could be made up by the arrival of new aircraft from the factories. The combat equipment of aviation in the active fleets was reduced to 723 aircraft.

In the first period of the war there were structural changes in the organization of fleet aviation. Fighter aviation was practically divided into point aviation which had as its purpose the antiaircraft defense of military naval bases and communications, and bomber and attack bomber escort aviation. A significant place in the combat formations was occupied by attack bomber aviation, armed with Il-2 aircraft. Chast's of reconnaissance aviation, using

Pe-2 and fighter aircraft were established; the MBR-2 seaplanes which remained fit were not used for reconnaissance, but for antisubmarine defense or as night bombers.

Naval aviation entered the war equipped with aircraft of obsolete types. There were also at the beginning of the war quite a few organizational defects and tactical weaknesses in the combat application of aviation. The command did not always sufficiently consider its capabilities and strong and weak points. In the first months of the war, the combat utilization of Military Naval Fleet Aviation suffered from the scattering of effort against many objectives. All these defects had to be overcome, in order to conduct a successful struggle with an air and sea enemy, -- and they were overcome in the course of combat actions in the first period of the war.

Into a Period of Fundamental Change

The Military Naval Fleet Aviation at the end of 1942 had 723 aircraft in the formations of the active fleets (37 torpedo carriers, 56 attack bombers, 112 wheeled bombers and reconnaissance aircraft, 382 fighters, the rest seaplanes), including: in the North Fleet -- 284, in the Red Banner Baltic Fleet -- 208 and in the Black Sea Fleet -- 231 aircraft [329]. In 1943, the quantity of aircraft steadily increased. At the end of the year, the combat formations had increased by 42%. The renewal of the aircraft stock of active fleet aviation was completed: old types of aircraft, except seaplanes, were replaced with new ones. /281

In the second period of the war, as in the first, the aviation of the Military Naval Fleet defended the bases of its fleet and the borders of the sea from the air and continued to carry out the missions of front aviation, but together with this, significantly stepped up its activities at sea, in particular against the enemy's sea communications, convoys and transports at sea and in the ports.[1]

The North Fleet Aviation went from occasional attacks at the seaports and ships at sea to systematic combat activities against sea communications.

In the North, sea communications were a matter of life and death for the enemy: due to the poor development of roads in northern Norway, the supply and replacement of fascist troops in the polar regions, and also export from Norway and Finland to Germany of stragetic materials (nickel and iron ore) were provided primarily by sea.

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[1]For the characteristics of the damage done to the enemy by the loss of his sea transport vessels, it is necessary to consider that a 10,000 ton water transport vessel can carry from 5 to 6,000 tons of various cargoes, i.e., in one passage it can transport 5 to 6,000 tons of ammunition or supplies or 70 to 75 heavy tank or up to 200 medium tanks or more than 2,000 soldiers with arms and ammunition. The land transportation of the cargoes carried by one such transport vessel requires more than 200 railroad cars or 1,200 five ton trucks.

All the forces of the North Fleet acted against the sea communications of the enemy: submarines, aviation, surface ships and torpedo boats. Aviation carried on combat actions in the region of Liinakhamari and Cape Nordkinn. In these actions, the attack bombers and fighters struck blows primarily in the Varanger-Fgord, and the bombers and torpedo planes operated further west.

In the second half of 1943, air blows at enemy convoys were struck by mass groups, consisting of torpedo carriers (bombers) and attack bombers escorted by fighters. The enemy covered his sea communications with fighters. Therefore, as a rule, actions against enemy convoys, particularly in the Varanger-Fgord, were accompanied by air battles, in which tens of aircraft took part. /282

Where circumstances permitted, different types of fleet forces were drawn into the destruction of powerful convoys. In this, aviation cooperated closely with submarines and surface ships. As an example, we can consider the destruction of an enemy convoy on a 14/15 September 1943. The convoy consisted of four transports and 22 guard ships, covered by fighters. On the morning of 14 September, air observation of the convoy was established. By day the convoy was attacked by submarines, which sunk one transport; in the evening 20 attack bombers struck blows at the convoy (the commander of the group was Captain G. V. Pavlov) and sank two transports; then torpedo boats were directed to the target, which sank the last transport on the night of 15 September. As a result of the combined actions of attack bombers, submarines and torpedo boats, all four transports of the convoy were destroyed. In the air battle the enemy lost 13 aircraft, our losses being five attack bombers and three fighters.

At sea and at bases, in the second period of the war, the North Fleet Aviation sank 21 transports and five convoy guard ships and several small ships.

As previously, one of the most important missions of North Fleet Aviation was the defense of its naval communications. The fleet bases and seaports were covered from the air by fighter aviation. The defense of ships and transports at sea was provided by fighters and antisubmarine patrols.

North Fleet Aviation simultaneously covered transport on the internal waterways and assured the passage within its zone of seven allied convoys from England and six to England. The battle for sea communications, the attack on enemy convoys and the defense of our own, required the achievement of mastery in the air in the fleet operational zone.

Fleet aviation systematically weakened the aerial enemy by blows at airfields. The airfields at Luostari, Khebutgen, Mayatalo, Kirkenes and Banak were subjected to several blows during 1943.

Fascist aviation suffered tremendous losses in air battles. Enemy aircraft attacking our sea communications, ports and transports at sea, met furious opposition from the North Sea fighters. Great air battles developed over Motov

Bay in connection with enemy attempts to break our sea communications. And fascist aviation, even in this, the closest region to its base, could not accomplish the task.

Severe battles developed everytime our aviation struck blows at enemy convoys, which were covered by powerful formations of fighters. Thus, on the 25th of July 1943, in the region of Varde, when 12 Pe-2 bombers escorted by 18 fighters struck a convoy covered by 30 fighters, 15 enemy fighters and five of our bombers and four fighters were lost [330]. /283

The former confidence and activity of fascist pilots dwindled rapidly, and occasions of their avoiding battle became more frequent. Thus, on the 13th of March 1943, a group of seven Ju-87's and 11 Me-109's, observed on the approaches to the chief base in the North Fleet by a patrol of our fighters, turned tail without dropping their bombs [331]. The same was repeated on 18 March. Even the fighters accompanying convoys did not always give battle.

The fascist command strengthened its aviation in the north, transferring the fighter group "Pride of Germany", made up of aces, to this region. On the 19th of April 1943, this group conducted its first battle with the fighters of the North Fleet. Sixteen enemy aircraft in three groups tried to strike a blow at the Vaenga Airfield. Six of our fighters, led by regimental commander Captain P. G. Sgibnev, gave battle in the course of which the enemy lost five aircraft. In this battle N. A. Bokiy shot down the enemy ace Muller, who had personally achieved 91 victories in air battles. Discouraged by the loss of five aircraft, the enemy did not show any activity for several days. Then six aircraft tried to make an attack on our airfield. After four of these six aircraft failed to return to their base, shot down in air battles, the detachment "Pride of Germany" ceased its activities [332].

The losses of enemy aviation were so significant, that already in the autumn of 1943, it could not make active attacks against the North Fleet, its bases, ports and communications, and was forced to limit itself primarily to cover of enemy convoys and ports.

The aviation of the Red Banner Baltic Fleet, which in 1941 and 1942 carried out almost exclusively front-line missions, in the second period of the war developed active operations against sea communications.

In the Baltic Sea, naval communications connected fascist Germany with its ally Finland, an army group "North" was to a significant degree supplied. There were military exports bringing raw materials to Germany for war industry. Actions against enemy communications became the largest operational mission of the Red Banner Baltic Fleet. /284

Considering their only real enemy in Baltic communications to be our submarines, the German fascist command decided to "bottle them up" in the eastern part of the Finnish Gulf. The enemy set up two antisubmarine barriers, antisubmarine mine positions and antisubmarine nets across the Finnish Gulf.

When it became obvious that it was impossible for submarines to go out

into the Baltic Sea, the Supreme Commander of the Military Naval Fleet, Admiral N. G. Kuznetsov, by a decision of the Supreme Command Headquarters assigned the mission of destroying sea communications of the enemy in the Baltic Sea to the forces of mine torpedo aviation. From the summer of 1943, mine torpedo aviation began to be used only at sea. Systematic actions by torpedo planes began against naval communications in the Gulf of Riga and the Gulf of Bothnia, the central and north portions of the Baltic Sea, and in isolated cases in its south portion.

The distance from the airfield to the area of action was more than 800 kilometers; almost all of this space was controlled by the enemy. Under such conditions, the most expedient operational procedure was found to be cruiser flights, flights by individual torpedo carrying aircraft hunting the enemy and attacking targets discovered.

In the first cruiser flight on 28 May 1943, Captain V. A. Balebin sank a transport. On subsequent days in the north and central portions of the Baltic Sea, Captain I. D. Shamanov, Senior Lieutenant A. I. Razgonin and Senior Lieutenant Yu. E. Bunimovich sank transports. In June, in the period of White Nights, there was an interruption in cruiser flights. In July the flights resumed and were conducted with growing strength and combat success to the end of the period.

The enemy strengthened the antiaircraft defenses of sea communications: antiaircraft armament was set up on transports and fighters were brought into the antiaircraft defenses of sea communications, setting up systematic patrols over some significant sections of possible torpedo carrier approach routes. But by changing the region of action and by varying tactical procedures, the torpedo carriers steadfastly continued to carry out their combat missions.

Up to the end of the year, 229 cruiser flights were carried out, of which 93 included torpedo attacks. About 60% of the torpedo attacks achieved results, leading to the sinking or damage of enemy transports and ships. The enemy lost /285 46 transports to the Red Banner Baltic Fleet Aviation in 1943.[1]

From the spring of 1943, attack bombers and bomber aviation developed active operations in the Finnish Gulf against the ships and launches of the enemy at the antisubmarine barriers, the patrol ships and communications of the enemy.

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[1] Total data on enemy losses, given on pages 282, 285 and following is taken from the Archives materials of the Historical Section of the Military Naval Fleet, compared with data from the enemy side given in the books of Ju. Meister (J. Mesiter, *Der Seekrig in den Osturopaischen Gewassern 1941-1945*, [The Sea War in East European Waters 1941-1945], E. Groener (E. Groner, *Die Schiffe der deutschen Kriegsmarine und Luftwaffe 1939-1945 und ihr verbleid*, [The Ships of the German Navy and the Luftwaffe in 1939-1945 and their Verfleid], in the Journal of Combat Activities of Army Group "North" and other materials of the Historical Section of the Military Naval Fleet, and includes enemy losses confirmed by both sides.

Attack bomber aviation was found to be an extremely effective weapon against low tonnage ships and transport vessels, and in mass utilization, against medium tonnage transports. Under the action of our attack bombers and bomber aviation, the enemy was forced to remove his ships to the western part of the Finnish Gulf, leaving only launches in the eastern part and using communications with the eastern part of the Finnish Gulf only at night.

A significant place in the combat activity of the Red Banner Baltic Fleet, as before, was occupied by the mission of supporting the troops of the Leningrad front.

In the operations to break the blockade of Leningrad from 12 to 30 January 1943, 132 naval aviation aircraft took part. The remaining forces of Red Banner Baltic Fleet Aviation were used to cover the Lake Ladoga Road, defend the region of Ostrov, conduct reconnaissance and carry out other missions. By the plan of coordination with the 13th Air Army of the Leningrad front, the bombers of Red Banner Baltic Fleet Aviation (including torpedo carriers as bombers), beginning on the night of 11 January and throughout the entire operation, systematically struck blows at the objectives assigned to them. The attack bombers supported the troops of the 67th Army of the Leningrad front in breaking through the defensive ring of the enemy, carrying out uninterrupted patrol action in the region of the front line. The fighters covered infantry by patrolling above the battlefield.

Naval aviation also took active part in the subsequent operations of the troops of the Leningrad front: at Krasnoborsk-Smerdynsk (10 to 23 February) and Mginsk (22 July to 4 August).

In the times of operational pauses, the active combat operations of naval aviation along the front did not cease. The avation of the Red Banner Baltic /286
Fleet struck blows at enemy airfields, land communications and other operational objectives. The attack bombers of the Red Banner Baltic Fleet destroyed 20 aircraft at the Kotly airfield on 20-21 March 1943 [333]. On 21 May, the dive bombers destroyed a railroad bridge over the Narva River, and the enemy required 28 days to erect new girders, replacing those which had fallen into the water. Over the period of an entire month, the railroad communications from Tallin to Gatchina, which were extremely important for the enemy, did not work [334].

Black Sea Fleet Aviation provided aviation security for operational and tactical landings in 1943.

In the operational landings in the region of Stanichka and Southern Ozereika from the 3rd to the 9th of February 1943, the Black Sea Fleet Aviation covered the landing from the ports at which the ships were loaded, in the crossing of the sea and in the area of actual landing. Directly before the landing, on the night of 3 February, the aviation carried an air landing. The bombers and attack bombers struck blows at the centers of enemy resistance in the region at which the landing was planned. In the course of the battle after the landing and in the first stage of the struggle on the staging points, from 4 to 15 February, fleet aviation made 1,383 aircraft flights [335].

The active and highly effective actions of aviation provided reliable air security for the landing and capture of the staging area. In the future, the Black Sea Fleet Aviation supported the troops of the landing throughout their entire seven month heroic struggle to hold the Myskhako staging area, which has gone down in the history of warfare as the Minor Land.

Black Sea Fleet Aviation was drawn into the security for the Novorossiysk landing operation of 9-16 September, and also provided aviation security for the operational-tactical landing of 25-27 September in the region of Lakes Solenoe and Blagoveshchenskoe and the tactical landing of 6 October at the Tuzla Sand Bar.

In the Kerch-El'tigen landing operation of 31 October - 10 December 1943, the Black Sea Fleet Aviation, strengthened by an attack bomber aviation division of the Fourth Air Army, provided security for the landing of the 18th Army in El'tigen. In the period of preparation for the landing operations from 23 to 31 October, the aviation destroyed the fire means and troops in the region of the Kerch Peninsula, covered the coordination of landing equipment and struck blows at the enemy combat cutters in the port of Feodosiya. On the night of 31 October, simultaneously with an artillery preparation for the landing. naval aviation bombed the enemy positions and the basic groups of German /287
fascist troops. From dawn of 1 November, the aviation provided support to the troops in the capture of the staging area. The enemy applied ferocious efforts to throw the landing troops into the sea. The troops holding the captured lines received reliable help from the aviation. On 3 November, the Military Council of the 18th Army wrote to the commander of the Black Sea Fleet, "Give the personnel of the Military Air Force of the Black Sea Fleet, who have supported us in the battle for the eastern shore of the Kerch Peninsula, gratitude from the infantry of our army! The pilots gave them great assistance in beating off 37 enemy counterattacks with tanks, which were made in the period of two days" [336]. The landing support involved aerial battles with enemy aviation. On 2 November the naval aviation had 22 aerial battles and shot down 25 enemy aircraft in the El'tigen region. On 3 November the commander of a squadron in the 47th Dive Bomber Aviation Regiment, Lieutenant B. N. Volovodov in a Il-2 aircraft with the squadron party organizer, Junior Lieutenant V. L. Bykov, as firer, expended his ammunition in beating off a tank attack and rammed a Ju-88 aircraft flying to bomb our troops. In its communication to the command of the Black Sea Fleet, the Military Council of the 18th Army then wrote,"...The names of Lieutenant B. N. Volovodov and Junior Lieutenant V. L. Bykov, who rammed a German Ju-88 aircraft, will be written in the list of Heroes of our army..." [337].

The Black Sea Fleet Aviation participated in the aerial struggle over the Kuban', conducted severe aerial battles over the Minor Land near Novorossiysk and acted against airfields.

Simultaneously with carrying out front-line missions, the fleet aviation conducted active combat operations against sea communications. The enemy on the Black Sea made wide use of Odessa-Crimea-Taman' communications, and also communications between the sea and Danube River ports of Rumania and Bulgaria and ports in the region of occupation. Transport was conducted primarily with self-propelled barges and ferries.

Due to the specific conditions of war in the Black Sea Theater, a significant place in the activities of aviation against sea communications was occupied by strikes at military naval bases and ports. In actions against "outlying" bases of the enemy at the forward lines, as a rule, attack bombers were used; at the remote ports bombers or torpedo carriers in bomber variations were used. The blows at the ports disrupted the enemy transport system and were the cause of significant enemy losses.

Thus, on 30 March 1943, 18 Il-4 aircraft of the Fifth Aviation Regiment of the First Mine Torpedo Division (commanded by N. A. Tokarev) in a flight against the port of Sevastopol, sunk three heavy transports and a self-propelled landing barge. In a flight against the same port by 36 aircraft of this division on 26 September 1943, a heavy transport, a barge and two launches were sunk, and the port equipment and warehouses were damaged [338]. /288

N. A. Tokarev

In the second half of 1943, fleet aviation developed operations against transport ships and ships at sea. During the Taman'-Novorossiysk and Kerch-El'tigen operations in the Kerch Straits, attach bombers sank and damaged tens of ships and transport vessels of various classes. The communications Sevastopol-Odessa and Sevastopol-Rumanian and Bulgarian ports suffered powerful effects from torpedo carriers and bombers in October-December of 1943, when in connection with the development of an advance by the Soviet troops in the Ukraine, the liquidation of the Taman' staging area and the blockade of the Crimea, naval communications increased greatly in significance.

Together with torpedo bomb blows at enemy ships and vessels, systematic mine laying was conducted on the approaches to enemy ports and in the centers of his communications.

With the liberation of South Tavriya, on an order from the Headquarters of the Supreme Military Command, a special aviation group of Black Sea Aviation for action against sea communications in the Western Crimean was set up in Skadovsk under the blows of the Skadovsk aviation group, the enemy was forced by November to significantly reduce transport between Sevastopol and Odessa.

As a whole, the aviation of the Military Naval Fleet in the second period successfully carried out its operational missions. It provided appreciable support to the troops acting near the seas. Developing actions against naval communications in the second half of 1943, Military Naval Fleet Aviation sank 53% of the total number and 45% of the ship tonnage lost by the enemy to blows /289

of our Military Naval Fleet in the second period of the war.

Great success was also achieved in the battle for mastery in the air. Fleet aviation reliably defended its military naval bases and communications from the air enemy. In air battles and from blows at airfields, the enemy lost about 1,200 aircraft. Mastery in the air was firmly maintained by our aviation.

Air Advances Over the Sea

At the beginning of 1944, the active fleets had 1,040 combat aircraft, including 123 torpedo carriers and 198 attack bombers. The distribution at the beginning of the period was: in the North Fleet 298, in the Red Banner Baltic Fleet 313 and in the Black Sea Fleet 429 aircraft.[339] The aircraft stock in the future up to the end of the war was maintained at a level of about 400 aircraft in the North and Black Sea Fleets, and in the Red Banner Baltic Fleet Aviation it was increased at the beginning of 1945 to 787 aircraft.[340]

In the third period of the war there was no significant requirement to use naval aviation as front aviation. The basic forces of naval military aviation were directed toward actions against sea communications and toward securing the sea flank in advancing operations by our troops. For the direct support of ground troops, fairly wide use was made only of the Red Banner Baltic Fleet Aviation.

In the advance near Leningrad and Novgorod in January-February of 1944, fleet aviation supported the troops of the Second Chdarnoy Army.

The operation near Leningrad began in unfavorable weather. On the 14th of January, due to the complex meterological conditions, it was not possible for our front-line aircraft or the enemy aircraft to leave the ground.

Only the pilots of the Eighth Mine Torpedo Aviation Division of the Red Banner Baltic Fleet, trained to fly under such conditions, destroyed at dawn on 14 January the enemy command point and communications center at Ropsha. From the morning of 14 January, the dive bombers commanded by Heroes of the Soviet Union Major A. A. Karasev and Captain Yu. A. Akayev, being unable due to the weather conditions to fly in groups, supported the infantry and tanks as individual aircraft, taking turns over the period of the entire day. On the day of 14 January, naval aviation conducted 67 aircraft flights under complex meteorological conditions. /290

In the succeeding days, the support and cover of land troops during daylight hours was provided practically uninterruptedly. In the operation 2,500 aircraft flights were made [341].

The command and troops of the Second Chdarnoy Army greatly appreciated the combat activities of the Red Banner Baltic Fleet Aviation. In the course of the operation, more than one letter was received thanking the pilots for their combat work. On 3 February 1944, in the newspaper, "Krasnyy Flot" [Red Fleet], there was a correspondence letter from the Leningrad front, in

which the tankers expressed their admiration for the actions of the Red Banner Baltic Fleet dive bombers. Part of the letter stated, "Our movement was somewhat slowed. And then in the air, the attack bombers of naval aviation appeared. We observed with admiration how they obliterated the enemy... After several flights by the attack bombers, we once again rushed to the attack... Occupying Gostilitsa, we saw with our own eyes, how terrible for the enemy the attack bomber flights had been. We saw destroyed command points, strafed Hitlerists, smashed trucks and vehicles, shattered wood and earth fire points and dugouts..."

In the Vyborg operation, the Red Banner Baltic Fleet Aviation supported troops of the 21st Army in breaking through enemy defenses and provided air protection for the landing of marines and 59th Army troops on the Islands of the B'erk Archipelago and the Vyborg Gulf.

In August of 1944, in the period of preparation for the Tallin operation, naval aviation successfully carried out the mission of annihilating the enemies Lake Chud flotilla. The enemy flotilla was significantly stronger than the 25th Brigade of river ships, which was ordered to transfer troops through the Chud and Pskov Lake Canal. There was a serious threat of destruction of the crossing. But the Baltic attack bomber aviation struck a series of blows at the Chud flotilla of the enemy and sank 24 self-propelled landing artillery barges, five armored launches and a gunboat. At the beginning of the troops transfer, the enemy flotilla ceased to exist.

On 15 September 1944, directly before the start of the Tallin operation, the Red Banner Baltic Fleet Aviation destroyed an attempt by the fascist command to capture by a landing the Island of Sursari (Gogland) occupied by a Finnish garrison. To conduct the landing operation, 1,600 soldiers and officers, more than 30 vessels of various types and a detachment of support and cover ships including six mine layers and eight artillery barges were assigned. /291

Aerial reconnaissance on the 14th of September discovered the concentration in the ports and bays of the south shore of the Finnish Gulf of several tens of various types of ships and vessels. An uninterrupted observation of them was set up. At dawn on 15 September, when the landing detachment went to the island and began to land troops, attack bomber aviation took to the air to attack the landing ships and troops. As a result of the first blows four high-speed landing-artillery barges, three mine sweepers, a guard ship, a tug boat and a schooner were sunk; many ships were seriously damaged. Suffering heavy losses, the detachment of ships left the island, leaving the landed troops to the mercy of fate [342].

From the beginning of the Tallin operation, Baltic aviation carried out a mission of supporting the troops of the Eighth Army, advancing along the shore of the Finnish Gulf.

In the Moonzund operation, fleet aviation protected the landing and combat activities after the landing on the Islands of Hiiumaa and Saaremaa. At the second stage of the operation, during the battles on the Syrve Peninsula,

the fascist command tried to support its troops with fire from naval artillery. The fleet bombing and attack bombing aviation was directed against the detachment of enemy support ships. Our bombers and attack bombers seriously damaged two cruisers, a squadron mine layer, four mine layers and 11 combat launches, sank four ships and forced the enemy to give up support of his troops from the sea [343].

In the conduct of the East Prussian operations, the Red Banner Baltic Fleet Aviation participated in the aviation preparation for the storming of Koenigsburg. At the time of the Eastern Pomeranian operation, naval aviation covered the sea flank and supported our troops with blows at enemy ships which fired upon our troops. The enemy provided fire support for his troops with the battleship Silesian, the cruisers Prinz Eugen, Lutzov, and Nurnberg, the auxiliary cruiser Orion, more than 10 squadrons of mine layers, the floating battery Hummel and other ships. The Eighth Mine Torpedo Aviation Division (commanded by Colonel M. A. Kurochkin) and the Ninth Attack Bomber Aviation Division (commanded by Lieutenant Colonel Ya. Z. Slepenkov) were directed against the enemy fire support detachment. Under the blows of our /292
torpedo carriers, dive bombers and attack bombers, the enemy ships could not carry out their mission: the artillery bombardment from the sea was broken. The enemy fleet, suffering losses and damages to its ships, was forced to withdraw to Swinemunde, where its remnants were taken care of by our aviation at the beginning of May.

The line-ship Silesian, the auxiliary cruiser Orion, two squadron mine layers, the floating battery Hummel and other ships were sunk; the cruiser Prinz Eugen was seriously damaged [344].

A significant contribution to the security of the advancing operations in the third period of the war was made by the Red Banner Baltic Fleet Aviation by active and highly effective operations on the sea communications of the enemy. Here the operations of aviation were directed against powerful operational targets: the destruction of the operational maneuvers of enemy troops by sea, the interruption of their supply and the transport to Germany of stragetic raw materials and other cargoes.

Throughout almost all of 1944, aviation was the only real force of the fleet acting on the communications of the enemy. Only at the end of 1944 did it become possible to bring torpedo boats out of the Finnish Gulf into the Baltic, and then to bring out several submarines, which sank 27 ships and vessels in the third period of the war. In the spring and summer period in the Central Baltic, Finnish and Vyborg Gulfs, the Red Banner Baltic Fleet Aviation sank 18 transports, 46 combat ships of various types, including 18 artillery landing barges used as transport vessels and seven auxiliary ships of various types.

The Hitlerist command took all possible measures to strengthen the anti-aircraft defense of communications: fighter cover of convoys, strengthening convoys with ships equipped with powerful antiaircraft armaments, antiaircraft artillery armament on transport vessels and the use of landing artillery barges with powerful general purpose artillery in convoys and for transport

crossings. In July of 1944, the antiaircraft defense cruiser Niobe was brought into the Finnish Gulf. Our air reconnaissance followed its arrival in the port of Kotka. On 16 July 1944, a combined blow of 28 dive bombers of the 12th Guards Aviation Regiment under the command of Hero of the Soviet Union Lieutenant Colonel V. I. Rakov and three massed top bombers (commanded by Lieutenant Colonel I. N. Ponomarenko) sank the cruiser Niobe [345].

The dive bombers scored several direct hits on the ship, and the massed top bombers[1] scored two hits with one ton bombs below the waterline. No antiaircraft defense measures could stop the victorious actions of the Red Banner Baltic Fleet Aviation against enemy communications. Blows at enemy sea communications grew steadily. In September of 1944, at the time of the Tallin operation, aviation sank and damaged in the port and along the communications from Tallin to Liepaya more than 20 transport vessels and ships of the enemy. /293

After the fleet aviation was rebased to airfields in the Baltic Republics in October of 1944, the zone of its activities included sea communications over a great area from the Moonzund Arkhipelago to the Shtettin Gulf. Aviation developed a wide attack on the enemy sea communications. The new bases made it possible to go from cruiser flights by individual aircraft to group and even mass blows of torpedo carriers, dive bombers and attack bombers at seaports and convoys at sea under fighter cover.

In September to December of 1944, the enemy lost 59 transports, 63 combat vessels of various types, 19 auxiliary vessels and 26 light barges [346]. 164 enemy aircraft were shot down in air battles.

The action of aviation on the enemy sea communications grew even more powerful in 1945. The enemy suffered significant losses from the blows of the Red Banner Baltic Fleet Aviation against convoys at sea. All enemy convoys attempting to move in the daylight hours, became the objectives of aviation attacks when they were discovered by aerial reconnaissance. In a number of cases, aviation blows annihilated all the transports of the convoys. On the 29th of January, the 51st Mine Torpedo Aviation Regiment sank two transports and the floating submarine base Memel [347]. On 13 February, a group consisting of two torpedo carriers and two massed top bombers covered by four fighters sank two transports. One of these was sunk when it was rammed by the aircraft flown by Junior Lieutenant V. P. Nosov: his aircraft was set fire in the attack and the pilot performed a high military feat, he aimed his flaming aircraft with its bombs at the enemy transport. On the 26th of March, blows by attack bombers, torpedo carriers and bombers under fighter cover in the region of Liepaya against a convoy consisting of tanker, a transport and four guard ships, sank the tanker, the transport and two trawlers protecting the ships. /294 The tanker Zasnitts carried about 5,000 tons of fuel for the troops in the Kuryand group [348].

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[1] Massed top bombers dropped their bombs in low level flight (at the altitude of the massed or its "top") with one ton bombs, which then riocheted into the side of the ship, at the waterline or struck the side of the ship directly.

At the end of March, the center of gravity of the struggle for sea communications was transferred to actions against the military naval bases and seaports of the enemy. With this, in the port and on the raids on Pillau alone, during March and April of 1945, 23 heavy transports and tankers and about 40 medium and small combat ships and auxiliary vessels were sunk.[349] In all, in the last four months of the war, the Red Banner Baltic Fleet Aviation and the front aviation cooperating with it sank 96 transports, with a total displacement of more than 270,000 tons, and also several tens of various types of combat ships [350].

In all, from the start of the war, the Red Banner Baltic Fleet Aviation sank 202 transports and 388 combat and auxiliary ships of various types belonging to the enemy.

The North Fleet Aviation also operated actively in 1944 against the sea communications of the enemy, carrying out missions in cooperation with the other forces of the fleet to destroy enemy transport and break up the supply of enemy troops and the removal of strategic materials to Germany. At the time of the Petsamo-Kirkenes operations, the aviation, besides covering the fleet landings and supporting the troops in the attack, successfully acte against communications, disrupting the enemy's evacuation. In order to protect its communications from the air, the Hitlerist command was forced to almost completely cease assigning its aviation to other missions. All its basic forces were thrown into the cover and defense of convoys and seaports.

The strengthening of the cover did not stop our fliers. The torpedo carriers, bombers and attack bombers struck massive blows against enemy convoys, on the principle of "power tactics": the fighters engaged in battle with the air cover of the convoy, and a portion of the forces taking part in the blow struck against the guard ship, clearing a path to the transports for the bombers and torpedo carriers. After the blow was struck, if the convoy was only partially lost or damaged and was not thoroughly destroyed, the blows were repeated.

A typical example of action by aviation against a convoy is the two-fold blow by North Fleet Aviation at a convoy discovered by aerial reconnaissance on 16 October 1944 at the exist from Bekf'ord. The convoy consisted of three /295
transports, two self-propelled barges, nine ships (including two torpedo boats) and 13 launches and was under the cover of a group of Me-109 fighters. At 1430 hours, a blow was struck by two groups of attack bombers and one group of torpedo carriers. As a result of the first attack by the attack bombers, a guard ship was destroyed and a trawler was set afire; the second group of attack bombers sank a torpedo boat, a guard ship and a launch. The torpedo carriers, following the attack bombers, sank a transport and a guard ship. In the evening, as the convoy approached the Kibergnes Cape, a second blow was struck, as a result of which two more transports, two guard ships and a trawler, damaged by the attack bombers in the first blow, were sunk. Thus, all three transports in the convoy and eight guard ships were destroyed. In the air battles, our fighters shot down four aircraft.

In the blow at the convoy, the commander of the Ninth Guards Mine Torpedo

Aviation Regiment Lieutenant Colonel B. P. Syromyatnikov and his crew perished heroically. At the time of the second attack, his aircraft was set on fire by a round from an artillery ship. The left motor caught fire, then the right and the wing. The crew did not turn from their combat course. It appeared to the group following him that he flew against the enemy like a blazing torch. The navigator Major A. M. Sknarev guided the flaming machine accurately at the target; the followers heard his clear commands to the pilot. Approaching the target at a range of 500 meters, the crew launched a torpedo and smashed the enemy transport. B. P. Syromyatnikov, A. M. Sknarev and the air firer, Senior Sergeant G. S. Aseyev were posthumously awarded the designation Hero of the Soviet Union.

The actions of North Fleet Aviation against communications in the third period of the war were extremely effective. The enemy lost 49 transports, and altogether from the start of the war the number of ships and vessels sunk by fleet aviation reached 74 transports and 26 combat vessels of various types.

In the third period of the war, as before, great importance for the North Fleet was attached to the defense of sea communications. Fleet aviation carried out daily missions in protecting internal transport, and also in bringing in nine allied convoys in 1944 and five convoys in 1945. In the defense of sea communications, a significant place was given to the utilization of fleet aviation in antisubmarine defense of communications. Aviation was used in antisubmarine defense in all sea theaters in the course of the entire war, in coordination with antisubmarine defense ships (PLO), having a mission of reconnaissance search for submarines. The widest application of aviation in the PLO system was in the North Fleet in the third period of the war. The /296
enemy introduced a great number of submarines for operations on the Barents Sea; in the last months of the war, 37 enemy submarines operated along the shores of Northern Norway and the Kol'sk Peninsula [351]. The submarine threat required the widest possible application of aviation for active operations in the PLO system. The aircraft made antisubmarine patrols over the special regions of the sea assigned to them and were included in the PLO forces of convoys. They were charged with the missions of hunting submarines, attacking, and guiding PLO ships to the submarines discovered. The submarines were hunted by seaplanes. Torpedo carriers, bombers and attack bombers flew out to the regions of discovery or where the submarines were thought to be for bombing, if necessary. The antisubmarine defense of convoys was carried out by pairs and single MBR-2 aircraft.

In the third period of the war the Black Sea Fleet Aviation had the primary mission of acting against sea communications. In operational coordination with submarines and torpedo boats in the period January-March 1944, the aviation broke up the transfer of the 17th German Army and the operational maneuver of enemy forces between the Crimea and the north west shores of the Black Sea. At the time of the Crimean operation (8 April to 12 May) the aviation cooperated with other forces of the fleet in carrying out the mission of disrupting the planned evacuation of enemy troops, and at the end of the operation and up to 9 September 1944, aviation destroyed communication between the ports of Rumania and Bulgaria. At the time of the Crimean operation, in the

A. M. Sknarev

ports of evacuation and at sea, aviation sank 68 transport vessels and ships of various types. As a result of the actions of the Black Sea Fleet on the sea communications of the enemy, even before the end of the operation, supply of the 17th German Army had been reduced by 20 to 25%. At the time of the troop /297
evacuation from the Crimea, ships were sunk whose tonnage was 42.8% of the total tonnage of enemy ships on the Black Sea in 1944.[352] According to information from the staff of the 17th German Army, in the evacuation by sea from the Crimea about 42,000 officers and soldiers perished [353]. And not a little of this was due to aviation. The enemy diesel electric ships Totila and Teya, completing the evacuation, approached the Khersones Cape on the night of 9 May and took on board 5 to 6,000 men. These were also sunk by aviation [354].

After the liberation of the Crimea, from 12 May to 9 September in the ports of Konstantsa and Sulina and at sea, aviation sank more than 50 additional ships and vessels of the enemy. Altogether the Black Sea Aviation from the start of the war sank 115 transport vessels of various types and 196 combat and auxiliary ships of the enemy.

As a whole, the third period of the war was a period of great activity and results in combat operations at sea for the Military Naval Fleet Aviation. The total enemy losses from Military Fleet Aviation in 1944 were more than 70% of the entire quantity of ships and vessels lost to our fleet, and in 1945 (on the Baltic Sea) more than 80%.

Aviation reliably protected the bases of its fleet and its communications, providing security for the combat actions of the ships. In air battles and on airfields about 1,300 enemy aircraft were destroyed.

By their active operations the Military Naval Fleet Aviation in the third period of the war provided considerable help to the Red Army in the destruction of near-shore groupings of the enemy in the North, in the Baltic and along the shores of the Black Sea.

The aviation of the Pacific Ocean Fleet (commanded by General P. N. Lemeshko) at the start of the war with Japan had combat equipment, including the aviation of the North Pacific Flotilla, six aviation divisions (mine torpedo, bomber, two mixed and two fighter), ten independent aviation regiments and 14 squadrons, 1,495 combat aircraft in all, of which 157 were torpedo carriers, 164 bombers, 243 attack bombers, 665 fighers, 45 wheeled reconnaissance aircraft and 221 seaplanes [355]. In the personnel cadres there was a significant number of officers with combat experience, who arrived at the Far East from the aviation of the North, Red Banner Baltic and Black Sea

Fleets. In addition, the aviation of the Pacific Ocean Fleet received three aviation regiments from the aviation of the North Fleet and the Red Banner Baltic Fleet. Our naval aviation in the Far East at the start of August 1945 was ready to carry out the order of the motherland, to destroy the Japanese militarists. /298

The basic content of the combat activities of Pacific Ocean Fleet Aviation at the start of military activities was the security of sea landing operations. Fleet aviation covered the landing detachments and supported their actions with bombing and attack bombing blows at enemy troops and their operational rear. In order to destroy the sea communications of the Japanese, attack bombing blows were struck at the ports of Korea. In the ports of Yuki, Rasin and Seisin, and at sea, 11 transports, tankers and passenger ships were sunk with a total displacement of 65,830 tons, and also a squadron torpedo boat of the type Kamikadze" [356].

By their heroic activities the Pacific Ocean pilots wrote new glorious pages in the history of combat activities by Military Naval Fleet Aviation. A higher military feat has made the name of Junior Lieutenant M. Ye. Yanko deathless. During a strike at an enemy transport in the Port of Rasin on 10 August 1945, his aircraft was hit and set fire. The pilot aimed his burning aircraft at the center of the enemy military port equipment and annihilated a valuable enemy objective [357].

The Pacific Ocean Fleet Aviation worthily carried on the valiant combat traditions of the Military Naval Fleet Aviation.

What were the overall results of combat action by naval aviation in the Second World War?

Military Naval Fleet Aviation in the course of the war made more than 350,000 aircraft flights; dropped over 27,000 tons of bombs and 1,371 torpedoes on the enemy; laid 2,425 mines. On the Barents, Baltic and Black Seas, aviation sank 610 combat and auxiliary ships of various types and 391 transports with tens of thousands of enemy soldiers and officers, and also hundreds of thousands of tons of all possible types of cargoes.

Naval aviation annihilated and damaged hundreds of artillery pieces, tanks, trucks and other technology of the enemy and destroyed many troops. In air battles and on the airfields it destroyed 5,521 enemy aircraft [358]. Aviation was the basic means of reconnaissance at sea and constantly provided the command with information about the sea enemy.[1]

The combat activities of the Military Naval Fleet Aviation were noted with 57 orders for combat decorations for chast's and aggregations; 17 regiments and divisions received the designation Guards. 241 aviators of the Military Naval Fleet were given the designation Hero of the Soviet Union. Five naval pilots, Lieutenant Colonel A. Ye. Mazurenko, Colonel V. I. Rakov, /299

[1] More than 50,000 aircraft flights were made during the war for aerial reconnaissance purposes.

Lieutenant Colonel B. F. Safonov, Lieutenant Colonel N. G. Stepanyan and Colonel N. V. Chelnokov received this designation twice.

N. V. Chelnokov

Naval aviation made a significant contribution to the combat activities of our fleets, for which all fleets of our nation, in 1965 in the celebration of the 20th Anniversary of the victory over fascist Germany were decorated with the order of the Red Banner, and the Red Banner Baltic Fleet received a second order of the Red Banner.

In the course of the war, the role of aviation in combat activities at sea was defined. Under the conditions of combat activity in the sea theaters of the Second World War, the Military Naval Aviation proved the major strength of the fleet. Aviation is credited with more than 50% of the tonnage of transport vessels and more than 66% of the combat and auxiliary ships lost by the Hitlerists from the actions of our fleet as a whole.

These are the brief general results of combat activity by Military Naval Fleet Aviation. It was not easy to achieve these results. The struggle was conducted with a powerful, active, stubborn enemy. Many naval pilots perished in this struggle.

The successes in action of Military Naval Fleet Aviation are first of all the results of bravery and self-sacrifice in the performance of their military duty by flight personnel. Trained by the Communist Party and the komsomol, the flight crews striving to achieve victory over the enemy did not spare their efforts or their very lives. It was not seldom that air crews, hit in an attack, dived against a ship to destroy the enemy while dying. In this manner the crews of Major V. N. Kashtankin, Captains A. A. Bashtyrkov, V. N. Belikov, V. N. Kiselev, Senior Lieutenant A. M. Romanov, Lieutenant A. I. Stratilatov, Junior Lieutenants I. A. Komozov and V. P. Nosov perished. /300

The commanders and warriors of the aviation schools and ground units and crews valiantly fulfilled their military duties, giving the flight chast's the capability of striking the enemy. The schools, reserves and training regiments uninterruptedly supplied the fleet aviation with flight cadres. At no time in the Military Naval Fleet Aviation was there a shortage of fliers.

To properly appreciate the feat of the pilot instructors in the schools, it is necessary to recall how heavily they bore their time "in the rear". Striving to get to the front, the pilot instructors and commanders of the training podrazdeleniyes submitted persistant reports requesting transfer to combat units. However, they had to overcome their personal desires and inclinations, and patiently wait their "turn" to be sent to the fleet, and tirelessly,

day after day prepare flight cadres. The work of the instructors and all personnel of the schools, training and reserve regiments deserves high appraisal: they made a significant contribution to ensuring the combat successes of the Military Naval Fleet Aviation.

The engineers, technicians, mechanics, motor specialists and other specialists of the engineer aviation service labored valiantly. Thanks to them, the aircraft stock of Military Naval Fleet Aviation always had the maximum quantity of aircraft in order, ready for battle flights, and aircraft damaged in combat were quickly repaired. Even in the most difficult times of the first period of the war, when the aircraft stock received no significant replacements of aircraft from the factories, the Military Naval Fleet Aviation was always in condition to fight. The self-sacrificing labors of the engineer technical staff are to a great degree the material basis for the combat successes of flight personnel.

Just as self-sacrificing and tireless were the labors of the officers and warriors in the communications units of Military Naval Fleet Aviation. They reliably ensured uninterrupted control to the troops, one of the necessary conditions of combat success.

A high appraisal has also been earned by the rear service, the work of commanders and warriors in the aviation technical bases and airfield construction battalions of Military Naval Fleet Aviation, who supplied bases, material technical supplies and all types of personal supplies for the flight units, for the utilization, defense and protection of airfields. The aviation medical service reliably ensured the combat capability of the pilots, healing them and returning many of them to action after wounds and illness. No small contribution to ensuring combat activity was made by the meteorological, mine torpedo and other special services.

An enormous role in mobilizing the forces of the personnel to fulfill /301
combat assignments was played by the political organizers, Party and komsomol organizations and their leaders, political workers N. S. Aleksandrov, S. S. Bessonov, L. N. Purnik, I. I. Serbin, A. N. Filaretov and others.

The work of the aviation staffs who provided direction for the forces, planned their combat activities and directed the operational-tactical preparation, deserves high acclaim. The officers of the operational service of the Military Naval Fleet Aviation, perfecting the methods of staff work, provided strong and reliable supervision of combat activities for the aviation chast's and higher organizations in the course of the war.

Aviation of the Military Naval Fleet in the Post-War Years

The most important thing in the post-war period for the development of Military Naval Fleet Aviation has been the perfection of combat training for aviation aggregations and units, the mastery by all flight personnel of new aviation technology, the uninterrupted strengthening of combat power and the maintainance of constant and high combat readiness for the defense of our motherland.

The post-war years are a period of introduction of new technology, the qualitative renewal of the aircraft stock, reequipment with jet aircraft and the foundation and mastery of neuclear bombs and aviation rockets. The Military Naval Fleet Aviation in the post-war period passed through the same stages of technological development and perfection as did the Military Air Forces as a whole.

Five years after the end of the war the reequipment of Military Naval Fleet Aviation with jet aircraft was basically completed, and then it received new combat means and aircraft, carrying aviation rockets. In the following years there is an uninterrupted process of qualitative perfection and renewal of the aircraft stock of Military Naval Fleet Aviation.

With the appearance and development of strategic rockets in the post-war period, military theory was made more accurate and more clearly determined the direction of application for aviation in sea theaters. Shore objectives, seaports and fleet bases can be destroyed with strategic rockets and submarine rockets. Therefore, the basic objectives of aviation are ships, submarines and transport at sea. Successful action against these sea targets requires particularly maneuverability, capable of matching their high mobility. Aviation which has operational and tactical maneuverability, has the capability to seek out the enemy at sea and strike blows, and is a powerful factor in the struggle with a naval enemy.

For the destruction of aircraft carriers, surface rocket carrying ships and transports in contemporary conditions, the most effective armament of aviation is air to ship rockets. In connection with this, the role of naval rocket aviation has increased. /302

One of the most important means of neuclear attack under contemporary conditions is rocket carrying submarines. Successful struggle with rocket carrying submarines requires special antisubmarine forces and means. And here one of the leading places is occupied by aviation.

The development of technology supplies aircraft and helicopters with contemporary devices for seeking submarines at great depths and powerful means for destroying them. Antisubmarine aircraft and helicopters will become the most effective means of struggle with submarines. Therefore, in the aviation of the Military Naval Fleet, there is antisubmarine aviation, equipped with special types of flying apparatus and manned by specially trained cadres.

In the armed struggle for sea (ocean) spaces, reconnaissance, intended to ensure timely discovery of a naval enemy with high operational mobility, has colossal significance. Aircraft, capable of observing wide areas of water in a short period of time, remains as before the basic means of conducting reconnaissance in the sea theater. In this, the previous reconnaissance aviation, conducting reconnaissance at sea primarily visually, has been replaced with qualitatively new technically equipped reconnaissance aviation of the Military Naval Fleet.

Naval rocket carrying, antisubmarine and reconnaissance aviation are the basic types of contemporary Military Naval Fleet Aviation.

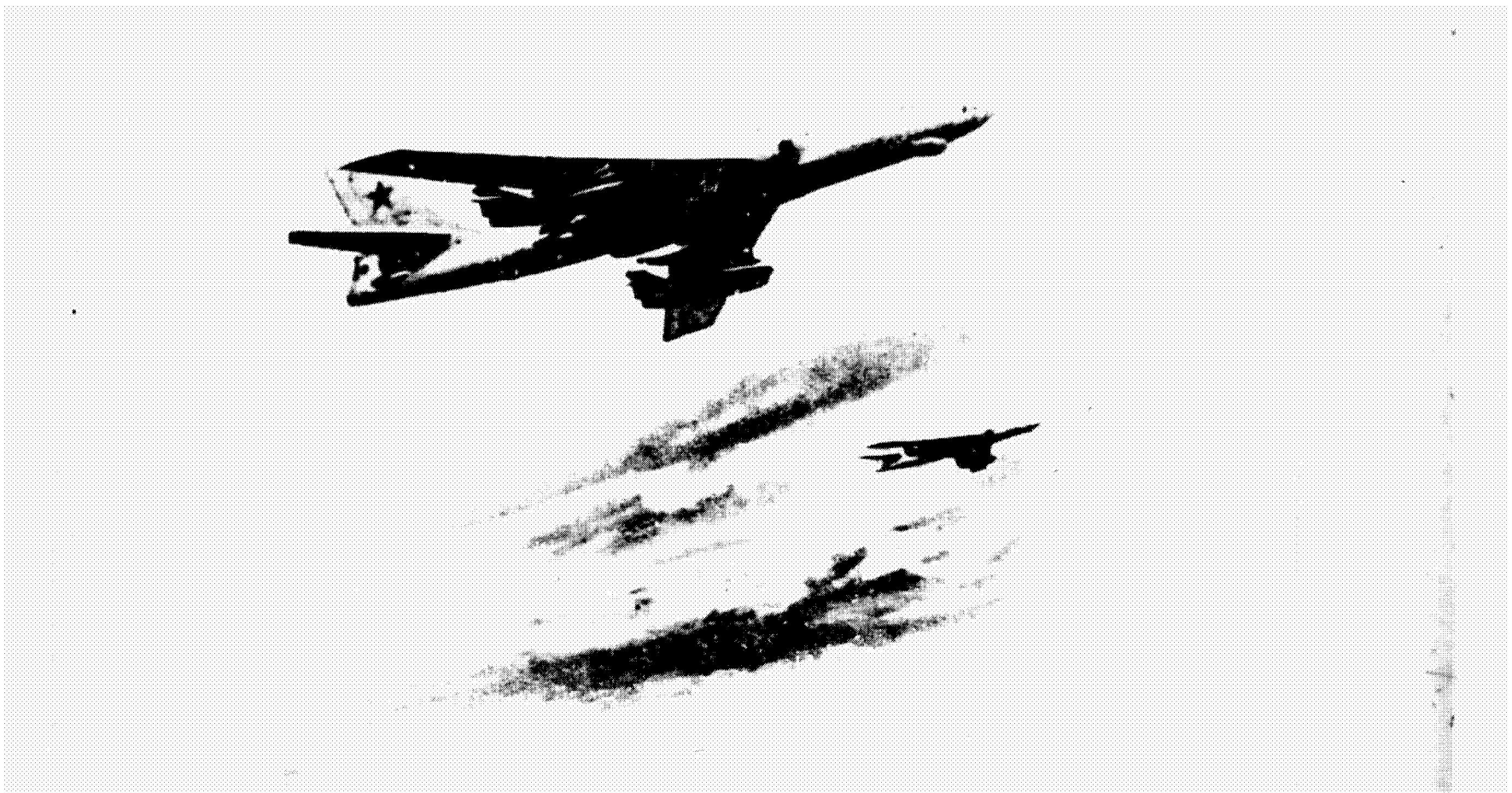
In the structure of our fleet, whose foundation is the submarine, aviation is an indispensable component element. The post-war conversions of our fleet are determined by the establishment of "a qualitatively new, neuclear rocket, submarine aviation Military Naval Fleet...".

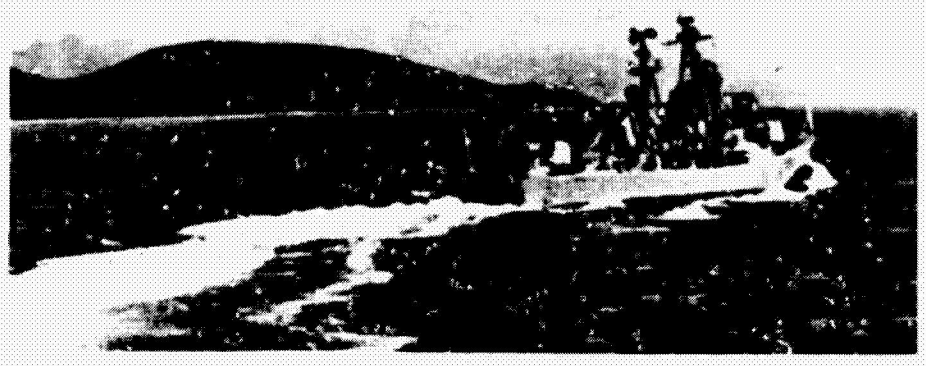
The combat formations of contemporary Military Naval Fleet Aviation include aircraft with great ranges of action, capable of discovering and destroying a naval enemy at great distances from our shores, independently and in cooperation with submarines.

The commanders, staffs and political organizers of the aggregations and chast's of Military Naval Fleet Aviation, basing themselves on the Party and komsomol organizations, have assured the achievement in the post-war period of a high level of combat training and combat readiness. In short periods of time they have solved the missions of converting to new technology and mastering new armament, learning the techniques of piloting and the combat utilization of aircraft in complex meteorological conditions. The crews have firmly mastered flights over great ranges with inflight refueling of aircraft, and have also solved other complex problems in combat training. In the 50's, hundreds of pilots and navigators were decorated with orders of the Soviet Union for high achievement in combat training. In the 60's a number of commanders and political workers of the leading chast's and podrazdeleniyes were decorated with orders of the USSR for success in directing and organizing combat and political training for the chast's and podrazdeleniyes. Among the first ones decorated were Colonel K. A. Stepochkin, Lieutenant Colonels A. I. Kokarev, and N. F. Komarov, and Majors S. V. Zubritskiy and A. A. Kalinin.

In daily combat training, based on the mastery of new technology and armament, combat readiness and military mastery are perfected, and new tactical procedures are worked out. The commanders of chast's and aggregations the officers of staff and flight personnel successfully perfect the operational arts and tactics of naval aviation.

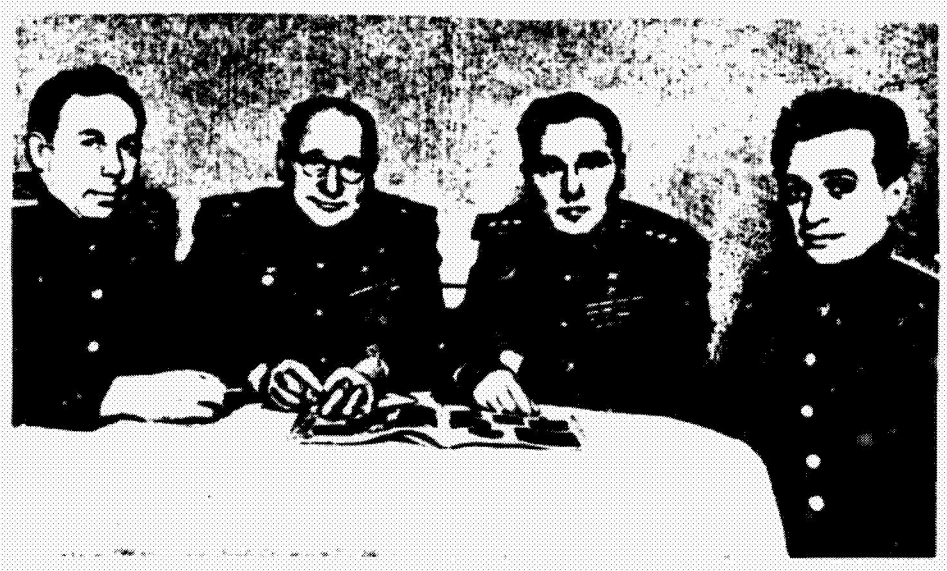
The further development of Military Naval Fleet Aviation is regularly assured by the possible character of struggle in sea theaters, the arrival of our fleet in the ocean spaces and the cooperation in these spaces of the chief striking powers of the Military Naval Fleet, submarines and aviation.





Rocket Carriers on Guard at the Sea Borders.

N. Ye. Zhukovskiy S. A. Chaplygin V. A. Vetchinkin



Aviation Designers (from left to right): S. A. Lavochkin, A. N. Tupolev, A. S. Yakovlev and A. I. Mikoyan.

Aerial Landing in Training

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CHAPTER 7

AVIATION SCIENCE AND TECHNOLOGY AND MILITARY THEORY

ABSTRACT. This chapter presents the technical aspects of the history of the development of Soviet aviation, beginning with the invention of the world's first aircraft in the 19th Century and extending through the present day. Particular attention is turned to the mutual influence of military theory and aircraft design. Operations of Soviet Air Forces during the second world war are used to illustrate the influence on strategy and tactics of available aircraft.

Soviet aviation was founded and developed on the basis of the leading achievements of science. The Communist Party and the Soviet government constantly devoted great attention to the work of scholars and designers, enriching aviation science with important discoveries which made it possible to construct the most modern aircraft, aviation engines and various items of equipment in our nation. On a strictly scientific basis, questions were worked out regarding the utilization of aviation for peaceful purposes and for the defense of the socialist fatherland.

From the first days of existence of the young Soviet state, scientific discoveries in the area of flight theory, all the achievements of Russian scholars and aviation designers were applied to practice in setting up the air fleet of the Soviet nation.

In the 19th century, science and technology in all areas of knowledge developed much more rapidly than in preceding centuries. Humanity was enriched with many important discoveries and inventions. Wide prospects for constructing flying machines arose on this base.

However, lifting off the ground on a heavier than air apparatus was not so simple. To solve the problem of flight on an aircraft, it was necessary to overcome considerable difficulties.

The total weight of the aircraft can be arbitrarily divided into four fractions: useful load, support surfaces, fuel and engine. A basic condition for ensuring the lift of the aircraft from the ground is the construction of

an engine with a sufficiently high power to weight ratio so that within its weight limits it can achieve a thrust capable of overcoming the resistance of the lift surfaces.

At the level of technology at the end of the 19th century, the weight of the glider was 50 to 60% of the total weight of the aircraft and the engine could not be assigned more than 40%. But the lightest steam engines of that time required a share of the aircraft weight somewhat greater than 100% in order to develop enough power to overcome the resistance of the glide surfaces in flight. This was because the specific weight of steam engines, expressed in kilograms of weight per unit power, at that time was 30 or more kilograms per horsepower. To lift into the air, it was necessary to build engine with a specific weight[1] approximately one third of this. /306

This task was perceived by A. F. Mozhayskiy, who first understood the importance of a simultaneous solution for the questions of aerodynamic quality and specific weight of the engine. By feel, he thought the most intelligent ratio between the weight of the aircraft, the area of the wings and the power of the engine. The inventor of the first aircraft in the world made flying models, towed kites behind a cart, fastened various loads to them and measured the speed, strength of pull on the towing line and lifted weight. Thus, Mozhayskiy determined the most advantageous aerodynamic qualities of a glider, the load on a square meter of wing area, the weight of the aircraft and the power of the engine.

The lack of an engine with low specific weight did not disturb Mozhayskiy. He himself perfected the Tamplya water tube boiler, planned lightened steam engines and, having constructed them, made an engine installation with a specific weight of 8 kg per horsepower. Thus, A. F. Mozhayskiy was the first man in the world to successfully connect a glider and an engine sufficiently developed to make the flight of the aircraft possible.

However, the rapid development of aviation began only with the first decade of the 20th century, on a basis of internal combustion piston engines, having a specific weight significantly less than that of steam engines. In December of 1903, the first aircraft with an internal combustion engine lifted into the air, constructed by the American Wright Brothers. At this time, the most varied types of flying apparatus began to be built. The designers tried by experience to find the most convenient geometric and weight relationships between the separate parts of the aircraft. These attempts to construct aircraft and fly on them without theoretical understanding of flight could not provide a high tempo of forward motion in the area of aviation technology. It was necessary to establish the underlying scientific base.

The scientists were occupied with the working out of questions in the theory of flight even before the first aircraft flights. In this, the first problems to be solved were connected with lifting force.

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[1] The specific weight is the weight of the engine divided by its power. It characterizes the weight development of the engine.

A leading role in establishing the scientific foundations of aerodynamics /307
was played by the work of Professor N.Ye. Zhukovskiy and his students The noted Russian scientist was able to discover the nature of the formation of lifting force and establish a metho for its determination. In the future, the solution of this problem was continued by his talented student, later an academician, S. A. Chaplygin, who brought this problem to an end, finding a theoretical form for a wing profile which had high aerodynamic qualities. Such profiles, called NYeZh profiles (after Nikolaya Yegorovich Zhukovskiy), were more than once used in practice and always served as a standard in the development of new wing profiles. The "vortex theory" developed by N. Ye. Zhukovskiy was used for aircraft propellers. Propellers designed with the use of this theory were also called NYeZh propellers, and were found in use to be significantly better than the propellers used previously.

N. Ye. Zhukovskiy's work, "On the flight of birds" contains the basics of flight dynamics. Here the theoretically different trajectories of gliding flight are investigated. One of these trajectories, the most complex, is a loop in the vertical plane. Flight along this trajectory was accomplished by P. N. Nesterov, 22 years after the scientist's book first appeared.

N. Ye. Zhukovskiy did not pass by the problem of stability and controllability. This complex problem was significantly more difficult and was more slowly solved. At the end of the last century, it was taken up by S. S. Nezhdanovskiy, who experimented with kites; by Langley, who launched models; by O. Lilienthal and Chanute, who devoted themselves to gliders. However, these investigators could not give satisfactory practical and theoretical results.

N. Ye. Zhukovskiy demonstrated that an aircraft must have the property of stability, i.e., it must maintain a given angle of attack in flight without assistance from the pilot, and he showed that to attain this it is necessary for the wing to have an angle of attack greater than the tail.

However, it was not possible to correctly calculate these angles at that time, since they did not know of the existence of downwash behind the wing. In addition, aircraft at the dawn of aviation had, as a rule, tail centering and were therefore unstable.

None the less, the first achievements of aviation science found wide application in practice and helped the designers to significantly improve the flight properties of aircraft.

The First World War demanded the creation of special aircraft: for air battle, reconnaissance and action against troops and the enemy rear. To solve this problem, it was necessary to sacrifice some properties of the flying apparatus for others. The answer to this question was found experimentally. /308

The fighter, for example, had to have relatively high speed and maneuverability, which required an increase in the fraction of weight assigned to the engine. Increasing the weight of the engine was possible only by reducing the weight of the useful load and fuel. Reducing the weight of the useful load and

fuel in turn required a reduction of the crew to one man, the sacrifice of bombing armament and a reduction in the range and flight time.

When making a bomber aircraft it is possible to increase the range by reducing the fraction of weight assigned to the engine installation, but this correspondingly reduces the speed. An increase in the load carrying capacity of the bomber can be attained primarily by increasing the dimensions and weight of the aircraft, which makes it possible to lift a greater weight with the same fraction assigned to useful load. In this way, the problems of differentiating aviation to perform its missions came about at the time of the First World War.

In the years of the First World War in Russia, outstanding examples of aviation technology were made. But mass production of aircraft was not set up. Tsarist Russia with its weakly developed industry and sluggish administrators and industrialists in the region of aircraft construction significantly lagged behind the other capitalist countries.

The Great October Revolution awakened the creative energy of our people to life. In the development of aviation science and technology a gigantic step forward was made in a short time.

The most important measures, designed to establish and strengthen the Soviet military air forces, were the organization of scientific institutes and higher aviation educational establishments, the construction of aviation factories and the founding of Design Bureaus.

The first scientific research institute, founded according to the government decree of 1 December 1918, was the Central Aerohydrodynamic Institute (TsAGI). The organizer and director of this institute was N. Ye. Zhukovskiy.

On the basis of the theoretical aviation courses existing at the E. N. Bauman Moscow Higher Technical School (MVTU) the Moscow Aviation Technical School was founded in 1919, converted in 1920 to the Institute of Engineers for the Red Air Fleet, and in 1922 to the Professor N. Ye. Zhukovskiy Military Air Academy. The academy played an important role in the construction of Soviet aviation in the first years of Soviet power. Until 1935, it was the only higher educational establishment which produced aviation engineers for /309
industry and Design Bureaus, for military and civil aviation. The engineer graduates of the academy first solved the difficult problems of founding Soviet aviation. The majority of them became scientific workers, directors of Design Bureaus, organizers of production and directors of the engineering aviation service of the Military Air Force.

On the basis of a "flying laboratory" a scientific experimental airfield was established in 1920, where new aircraft were tested, and scientific work connected with flight was conducted. The newly founded scientific experimental airfield united the creative forces of the best commanders, pilots and scientific engineering workers. In 1926 it was converted to the State Scientific Experimental Institute of the Military Air Forces, becoming the basic

center for test and selection of aircraft suitable for acceptance as military Air Force equipment.

The overwhelming majority of Russian scientists and engineers were unconditionally on the side of the revolution from the first days of Soviet power and self-sacrificingly worked to set up the Red Air Fleet. Scientists N. Ye. Zhukovskiy, S. A. Chaplygin, B. N. Yur'yev, V. P. Vetchinkin, A. N. Tupolev, G. Kh. Sabinin, B. S. Stechkin, K. A. Ushakov, A. A. Arkhangel'skiy, made great contributions to Soviet aviation science and technology.

The Party and government demonstrated tireless concern and attention to them. In a decree of the Council of Peoples' Kommissars on 3 December 1920, signed by V. I. Lenin, the great merit of N. Ye. Zhukovskiy as the "father of Russian aviation" was noted. He was released from lecturing in second level courses and was given a personal pension.

The basic task of the scientists was the development of an organized theory of stability and control for aircraft. The solution was connected first of all with the development of the theory of flight dynamics, the foundations of which had been laid by N. Ye. Zhukovskiy. Flight dynamics made it possible to carry out aircraft design calculations for strength and determine the loads acting on the aircraft in flight. Flight dynamics received further developments in the work of scientists N. Ye. Zhukovskiy and V. P. Vetchinkin, B. N. Yur'yev and particularly V. S. Pyshnov. V. P. Vetchinkin experimentally determined the limiting loads in flight, laid the foundations for aircraft design calculations for strength, developed the question of landing and established methods for design calculation and design of air propellers. All his work on flight dynamics found its completion in the book, *Dinamika poleta*, [Flight Dynamics].

B. N. Yur'yev published a work on methods of determining downwash behind the wing and the calculation of aircraft longitudinal static stability.

V. S. Pyshnov developed methods for determining loads in flight in unquiet air and in curved flight; established methods for calculating the static stability and controllability in curved flight; discovered the significance and role of bending moment and torque from air loads. /310

All these works made it possible to carry out more correct calculations for aircraft strength and avoid the destruction of aircraft in flight. The accurate calculation of aircraft centering greatly increased stability and sharply reduced the number of accidents.

The investigation of flight dynamics in supercritical conditions, conducted by V. S. Pyshnov, revealed the causes of spin and the factors influencing its stability, and also demonstrated techniques which made it easier to get out of a spin. The recommendations and results made by V. S. Pyshnov were used by designers and engineering flight personnel to eliminate flight emergencies in spins. Aircraft became stable and controllable.

Based on the development of aerodynamics, aircraft and engine construction,

the speed and altitude of flight continued to grow. At the same time, there was a practical requirement for an increase in lifting capacity and range of flight of aircraft. To increase the fraction of weight assigned to fuel and thus increase the range of flight, it was necessary to reduce the fraction of weight for useful load and engine. But reducing the fraction of weight for useful load while increasing the loads themselves led to a tremendous increase in the flight weight of the aircraft, and this caused great difficulties for the lifting surface design of the aircraft. The difficulties were caused by the fact that an increase in the flight weight of the aircraft was accompanied by an increase in its geometric dimensions, and this in turn led to a powerful increase in the fraction of weight assigned to the lift surfaces. Thus, the task of building aircraft of large dimensions and weight became insoluble for geometrically congruent aircraft.

It was necessary to give up geometric congruents and establish aircraft in new shapes. Great scientific design work was required, which was taken up by A. N. Tupolev, one of the talented students of N. Ye. Zhukovskiy.

A. N. Tupolev's Design Bureau found a solution to the problem of building heavy aircraft in the development of multi-engine monoplanes. With this the construction of all metal aircraft began. As a replacement for wood, which was the basic material in aircraft construction in the 20's, the initiative of A. N. Tupolev led to the wide introduction of a light and strong metal, duralumin.

A. N. Tupolev found the design forms which were to the greatest degree /311
appropriate for the new material, making it possible to eliminate from the design the high "working" stresses.

He accomplished the transition to a free supporting type of glide surface, having low drag and making it possible to use construction materials with stresses close to the rupture point. With an increase in the load per square meter, there was a reduction in the wing space and therefore, a reduction in its weight and drag. The use of an aircraft design with the motors on the wings made it possible to greatly unload the wing in flight and reduce its weight. In place of linen on the wings, thin corrugated facing began to be used, which gave the wings great rigidity in torsion. All this made it possible for the A. N. Tupolev Design Bureau to build a family of aircraft in the first years of Soviet power, whose flight weight increased ceaselessly. The basic characteristics of the ANT aircraft are shown in Table 1.

In the process of building new machines, useful discoveries were made in the fields of aerodynamics, controllability and particularly in the theory of construction and design strength. Thus, a new method for design calculations for aircraft was developed by V. N. Belyayev, a talented coworker of A. N. Tupolev. His methods was at the basis of all design calculations for wings of various shapes and profiles. Contemporary practice in the design calculation for tapered and triangular wings is based on it.

In 1933, the RD (record distance) aircraft was constructed, in which Soviet pilots made a number of outstanding nonstop flights. P. O. Sukhoy,

V. N. Belyarev and A. A. Mikulin took part in the development of this machine. P. O. Sukhoy used a very elongated wing, which made it possible to substantially increase the economy of the aircraft and reduce the amount of fuel expended per kilometer. Across almost the entire leading edge of the wing there were tanks of fuel, which significantly reduced the weight of the wing design. The accurate wing calculation is carried out by V. N. Belyerev made it possible to obtain the necessary strength at minimum weight. The engine constructed by A. A. Mikulin was distinguished by its low specific weight. With this, the stability and reliability of operation of the motor guaranteed the aircraft the necessary range of flight. The RD aircraft had a theoretical flight range of about 15,000 kilometers. /312

TABLE 1

Year	Designation		Weight, tons	Useful load, tons	Range, km	Speed, km/hr	Motor designation	Number of Motors	Power, hr	Load per square meter
	Design Bureau	Military Air Force								
1925	ANT-4	TB-1	6.56	1.70	1200	200	M-17	2	1200	56
1933	ANT-6	TB-3	17.40	5.00	1000	215	M-17	4	2500	75
1933	ANT-16	TB-4	33.40	5.00	1400	245	M-34R	6	5000	80
1934	ANT-20	"Maksim Gor'kiy"	42.00	8.00	1000	260	M-34-FRN	8	8000	86

P. O. Sukhoy

Thus, A. N. Tupolev and his coworkers found the theoretical and design principles for making aircraft of great weight. These principles control the aviation design of all nations. The successful solution by our scientists and designers of the problem of building heavy aircraft with great flight ranges made it possible for Soviet aviation science to take a leading place in the world.

In the first years of Soviet power, the development of our aviation was slowed down by the absence of good engines. The weak industry left over from tsarist Russia was not in condition to provide the necessary quality production of aviation engines. They had to be purchased abroad.

With the victory of the October Socialist Revolution, the Communist Party and Soviet government gave the scientists the problem: build their own aviation engines. The first M-5 engine with the power of 400 horsepower

was built in 1923 in the Ikar Factory, under the direction of Professor N. P. Makaruk. In 1924, the engine was put into mass production. Aviation designers quickly used the new engine in building aircraft. The I-2 fighter designed by D. P. Grigorovich and the R-3 reconnaissance aircraft designed by A. N. Tupolev had M-5 engines.

In the same year, 1924, the Design Bureau of A. D. Shvetsov made the first air-cooled Soviet aviation engine, the M-11, with an output of 100 horsepower. This engine was put into the U-2 (Po-2) aircraft designed by N. N. Polikarpov. /313

The Po-2 aircraft with the M-11 engine set an aviation record for duration of use. It was used in the military Air Force and civilian economy for over 30 years.

N. N. Polikarpov

Approximately 10 years after the appearance of the first Soviet aviation engines, engine construction achieved great successes thanks to the cooperative work of scientists, designers and production specialists. The basic problem solved by the scientists and designers in this time was the building of engines with a significantly reduced specific weight, specific frontal area and specific fuel expenditures[1].

This problem was solved by stepping up the engines in speed and power. Even without a complete development of questions of strength, gas-dynamics and dynamics, it was possible by boosting the engines to experimentally achieve a reduction in specific weight and specific front.

The scientific work carried out by R. S. Kinosashvili on strength, B. S. Stechkin on gas-dynamics and I. Sh. Neyman on dynamics provided theoretical foundations for improving the basic characteristics of engines.

An effective means for improving the quality of aviation motors was an increase in the number of revolutions, which was brilliantly demonstrated by V. Ya. Klimov and I. Sh. Neyman. The possibility of increasing engine power by pressure feed was theoretically substantiated by V. I. Dmitrievskii, and realized in design by A. D. Shvetsov and A. A. Mikulin.

In 1932, the work of Soviet scientists and designers under the direction of A. A. Mikulin culminated in the building of the new M-34 engine of 850 hp.

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[1] Specific frontal area means the area of the frontal cross-section with respect to units of power. The specific fuel expenditure is the hourly expenditure of fuel related to units of power.

Its specific weight was altogether 0.63 kg/hp. In comparison with the previously constructed M-8 engine of 750 hp, weighing 800 kg, the M-34 had a specific weight 1.6 times less. /314

After the installation of M-34 engines, the flight tactical characteristics of the TB-3, R-5 and "Maksim Gor'kiy" aircraft improved sharply and became better than that of foreign machines in similar classes. The high reliability of the new engine was considered in building the RD aircraft. The great power of the engine, which it developed on the ground, stimulated S. V. Il'yushin to make it his choice in the design of an attack bomber aircraft.

The Design Bureau directed by A. D. Shvetsov developed the M-25 family of air-cooled aviation engines, and then the M-62's. The M-62 motor was placed in the I-15 and I-16 fighters, built by the Design Bureau of N. N. Polikarpov. This same engine worked without failure in the Li-2 military transport aircraft.

A. D. Shvetsov, successfully developing the idea of reducing specific frontal resistance of engines, built the ASh-82 double row star shaped engine, which was placed in the La-5 and Pe-8 aircraft.

The M-103, M-105 and M-107 motors, built in the Design Bureau of V. Ya. Klimov, were water-cooled, and their characteristics were sequentially improved primarily by increasing the number of revolutions and the feed pressure. These motors were used in designing the fighters Yak-1, Yak-7, Yak-9, Yak-3 and the bombers AR-2 and Pe-2.

The Design Bureau directed by S. K. Tumanskiy worked particularly on "two row star" motors, using the M-85 engine as a base for developing the new type engines M-87, M-87A and M-87B. These motors were used in the DB-3F (Il-4) aircraft, developed in S. V. Il'yushin's Design Bureau.

Foreign experience was also used in setting up the national motor construction.

In the 30's, Soviet scientists and aviation designers made central improvements in the aerodynamic qualities of aircraft. Newly discovered methods of reducing aerodynamic resistance were embodied in the designs of new aircraft. The frontal resistance was reduced by approximately a factor of two, as a result of which there was a significant improvement in the flight characteristics of aircraft.

The resistance of an aircraft to a stream of air from the front was significantly decreased by using smooth coverings in place of corrugated ones, and also by eliminating all projections on the surface of the wings and fuselage. These were the years in which closed cockpits, retractable landing gear, ferring and engine cowlings were introduced. The best aircraft of this /315
period were the I-16 fighter, made in the Design Bureau directed by N. N. Polikarpov, and the SB (speed bomber) front-line bomber, made in the Design Bureau of A. N. Tupolev by a design brigade under the direction of A. A. Arkhangelskiy.

V. M. Petlyakov

In solving questions of perfecting and developing aircraft, aviation science encountered a very complex problem, in flights at high speeds, vibrations arose in the construction of the aircraft and cases in which aircraft were destroyed in the air by these vibrations became more frequent. It was necessary to find an explanation for this phenomenon and develop measures to prevent these unfortunate occurrences in flight. E. P. Grossman, M. V. Keldysh and others were able to successfully solve this complex problem. They developed a theory of self-exciting oscillation (flutter) and a method for calculating them; they analyzed the factors which influenced their occurrence. It became possible to design reliable and stable aircraft.

At the end of the 30's, the Communist Party and Soviet government made a number of decisions intended to further the development of aviation science and technology in our country. There was a significant growth in the volume of scientific investigation in the areas of aerodynamic, aircraft construction theory, engines and aviation equipment and armament.

There was significant growth in the volume of scientific investigations carried out by the scholars of the Central Aerohydrodynamic Institute. The experimental base of the TsAGI improved. At this time, a wind tunnel was constructed for testing aircraft by actual measurement. New research institutes appeared, the Central Institute of Aviation Motor Construction (TsIAM) and the All-Union Institute of Aviation Materials (VIAM), which developed in a short time into powerful scientific research centers. In addition, as aviation technology became more complex, scientific research /316
organizations and Design Bureaus arose for equipment, radio, electronics, armament, automation and other interests. The building of an aircraft now began to involve simultaneous participation of many special institutes and Design Bureaus. The tremendous creative work carried out by the scientific, design and production collectives, gave positive results: national aviation science was established, experimental models of aviation technology were built and aviation production was organized.

At the start of the 40's, our nation had highly qualified scientific and technical cadres and an experimental base secured by the experimental design work of numerous Design Bureaus. A powerful industrial base had been established, which provided the construction of experimental and series models of aviation technology. The highly qualified collectives of experimental institutes were capable of quickly bringing into production experimental machines and eliminating defects both in the aircraft of the military Air Forces and in the aircraft of the Civil Air Fleet.

Pe-8 (TB-7) Heavy Bomber Designed by V. M. Petlyakov in Flight 1939.

Well before the start of the Second World War, all the forces of the scientists and designers had been directed toward building better aircraft, motors, aviation artillery and bombing equipment, sites and aircraft armament than that possessed by the probable enemy, fascist Germany, and thus insuring the victory of Soviet aviation if the aggressor should unleash military operations against our motherland. Even in the pre-war years, the Pe-8 heavy bomber of V. N. Petlyakov, his front-line dive bomber, the Pe-2, the Il-4 long-range bomber of S. V. Il'yushin, the Yak-1 fighter of A. S. Yakovlev, the Lagg-3 fighter of S. A. Lavochkin, M. I. Gudkov and V. P. Gorbunov and the Mig-1 of A. I. Mikoyan and M. I. Gurevich had been designed and experimental models had been constructed. /317

For speed, bombing load and armament these aircraft surpassed the aircraft in the equipment of fascist Germany. However, we did not succeed in converting Soviet aviation to the new aircraft before the start of the war, and our pilots had to fight basically with aircraft constructed in 1932 to 1936.

An outstanding role in the Second World War was played by the attack bomber aircraft of S. V. Il'yushin, the Il-2. Aircraft of this type, working with infantry directly on the field of battle, successfully annihilated tanks, artillery, enemy fire points and other objectives.

If A. N. Tupolev first discovered and realized the way to increase the flight weight of aircraft, S. V. Il'yushin first found and realized the way to make an aircraft which could successfully perform combat missions on the field of battle, since it was not very vulnerable to the ground and air fire of the enemy. During the course of the war, our enemy was not able to build an aircraft similar to the Il-2 attack bomber.

The Il-2 attack plane was extremely effective and was the only infantry support aircraft in the world. Especially for this aircraft, there was a modification of the AM-35 engine, which thanks to the reduction in altitude, increased its climbing power, substantially increasing the flight characteristics near the ground which are important for an attack plane (run, maneuver and acceleration). Armor was successfully used in the Il-2 as a construction element, protecting the most important vital parts of the aircraft from damage by the enemy and as part of the fuselage, bearing powerful loads.

The attack plane had powerful machine gun-cannon and rocket armament, and racks for carrying bombs of various sizes. All this gave the attack bomber good speed and maneuverability near the ground and powerful artillery and bomb armament, and made it less vulnerable to ground and air fire from the enemy.

The German attack bomber HS-129 (Henschel) was significantly behind the I1-2 aircraft in maximum speed, range and armament.

In the course of the war, the Soviet people, led by the Communist Party, enthusiastically overcame the difficulties of wartime, steadfastly increased the production of aviation technology and improved its quality. In this there was an uninterrupted improvement in aircraft already in production, which made it possible to maintain their superiority in technical flight characteristics. Thus, the I1-2 attack bomber was converted from single place to two place and this provided the aircraft with protection against air attack from fighters /318
above and to the rear. The power of the engine near the ground in this aircraft was increased from 1,600 to 1,750 hp by the reduction in altitude; the ShVAK cannons (20 mm) were replaced with more powerful cannons, the VYa (23 mm), and then with a 37 mm cannon; the aircraft aerodynamics were improved, which gave an increase in speed of 35 km per hour; there was a change in the position of the oil radiator and this reduced the frontal resistance of the aircraft and its vulnerability.

Parallel with the modification of the I1-2, the Design Bureau led by S. V. Il'yushin planned, constructed and put into serial production a new attack bomber, the I1-10, with the more powerful AM-42 engine (2,000 hp), good armor, the improved NS-23 cannon and a two-fold reduction in aerodynamic resistance.

The flight characteristics of the I1-2 and I1-10 aircraft are shown in Table 2.

TABLE 2

Attack Bomber	Power	Maximum speed	Rifled Armament	Bombing armament
I1-2	1750	372	1 × 12.7; 2 × 20; 8 × 82	400
I1-10	2000	507	3 × 23; 8 × 82	400

The fighters were steadily improved and perfected during the course of the war by new modifications. By increasing engine power and lightening aircraft construction, the Design Bureau of A. S. Yakovlev developed the Yak-1 family of fighters in the direction of increased range (Yak-9) and improved speed Yak-3. The maximum speed of Yakovlev's fighters grew from 580 to 720 km/hour.

There was a similar growth in the flight speed of the fighters from the Design Bureau of S. A. Lavochkin, from 560 (Lagg-3) to 680 km/hour (La-5).

Thus, our science and technology and the whole Soviet people, led by the Communist Party, successfully developed aviation and thus ensured its technical superiority over the aviation of the enemy at the time of the Second World War.

After the Second World War, aviation science reached new heights. The Communist Party gave Soviet scientists a complex and responsible task: to work out questions in the design of jet aircraft, breaking the sound barrier and putting into production improved technology based on the use of all the achievements of related sciences.

The first requirement was the mastery of supersonic flight. From this, /319
it was necessary first of all to establish the appropriate aerodynamic shape of the aircraft.

In our nation, even before the war, wind tunnels had been set up with flow speeds close to the speed of sound. Tests of model wings in these tunnels showed that at flow speeds close to the speed of sound, the drag coefficient of the wing increases seven to ten times. It was necessary to find new wing shapes, whose drag at supersonic speeds would not reach such high values.

The foundations for the handling of this question were given in the doctoral disseration of S. A. Chaplygin, "On gas currents" which he had defended in 1902. Based on this work, the scholars developed Chaplygin's method and made practical recommendations for ways to reduce the increase in drag coefficient when exceeding the speed of sound from seven to ten times down to two to three times. Particularly useful results about ways of overcoming the sound barrier were made in the works of S. A. Khristianovich, M. V. Keldysh and others.

Simultaneously, Soviet scholars solved a number of important problems connected with high flight speeds, which interfered with the control of the aircraft in flight and in landing. In particular, explanations were found for such phenomena as aircraft slowing in dives, the delayed onset of flow disruption at the tip of the profile and oscillation of the nose wheel in landing. Methods were worked out for improving controllability and ensuring the transition to a completely movable aircraft tail section. An explanation was found for the increase in forces on the controls, caused by the difference in the nature of formation of lifting forces in subsonic and supersonic flow, on the basis of which amplifiers were introduced into the design of aircraft.

However, the drag coefficient of an aircraft in flight at supersonic speeds remained two to three times greater than the drag coefficient of an aircraft at subsonic speeds. For flight at supersonic speeds, it was necessary for the specific weight of the engine to be also reduced by two to three times. Piston engines could not give such a saving in specific weight.

The solution to the problem was found in the use of jet engines. First, attempts were made to place liquid fueled rocket engines on aircraft.

The first Soviet aircraft with a liquid fueled rocket engine BI, was made by the design collective led by V. F. Bolkhovitinov. The first flight in this aircraft was made by test pilot G. Ya. Bakhchivandzhi on 15 May 1942.

G. Ya. Bakhchivandzhi

Liquid fueled rocket engines expended a great deal of fuel and therefore could not be used for prolonged flights in the atmosphere. Aircraft flying in the atmosphere required a more economical type of engine. Liquid fueled engines became the basic engines of rockets. /320

The theory of jet engines was developed by B. S. Stechkin in 1929. In 1932, K. E. Tsiolkovskiy considered the possibility of using jet turbine engines in aircraft to achieve speeds close to the speed of sound. Work began on the design of gas turbine jet engines in the 30's by V. V. Uvarov and A. M. Lyul'ka.

Even the first, imperfect examples of jet engines for speeds of flight of 700 to 800 km/hr were found to be more than four times lighter in specific weight than piston engines. A particularly significant property of jet turbine engines was the ability to increase thrust as speed increased.

The basic defect of turbine engines was that at low speeds the thrust was sharply reduced. This worsened the flight characteristics of jet engines. However, the low specific weight for thrust of jet engines compensated for this defect.

The Design Bureaus of A. A. Mikulin, V. Ya. Klimov, A. M. Lyul'ka, N. D. Kuznetsov, V. V. Uvarov and others went from working on pistons to building turbine engines. The forced labors of the design collectives were crowned with success. In reduced periods of time, they developed various types of jet engines for military and civil aircraft.

The aircraft designers, A. N. Tupolev, S. V. Il'yushin, A. I. Mikoyan, P. O. Sukhoy, A. S. Yakovlev and others built jet aircraft, basing themselves on the preparatory studies of the scholars at TsAGI on the optimum form and profile of aircraft lift surfaces, on achievements in the field of engine construction and on the successes of the creators of new equipment and armament. Soviet scientists and designers were able to quickly develop new jet bombers, fighters and transport aircraft, surpassing in many characteristics the examples of foreign aviation technology. /321

Flight at great speeds has its peculiarities. The time for the crew to

solve all tactical, piloting and navigation problems is shortened, the performance of maneuvers is complicated, the accuracy of bombing is reduced and so forth. In a number of cases, crew members lost the possibility of reacting with the sense organs in a timely manner to changes in flight conditions, or of considering the indications of instruments in time. The scholars were given a new problem of aiding the crew in carrying out its functions. First of all, it was necessary to supply the crew with additional information about flight conditions, and also to automate some operations.

Radar widened the field of view of the crew. The use of electronic instruments for aircraft guidance made it possible to solve many aerial navigation problems automatically. The utilization of automatic siting apparatus increased the accuracy of bombing and the precision of rocket launching.

A very great role came to be played by ground means of flight control. As a result, it was possible to free the pilot from a number of functions in choosing a route and mode of flight.

The "BI", the First Soviet Rocket Aircraft, Designed by V. F. Bolkhovitinov.

Instruments from which the correctness of aircraft control can be judged, /322 became even more and more numerous. They appeared and were developed independently of each other and did not form a single system, reflecting all factors in flight (air and ground situation, target characteristics, flight mode, operation of power installations, operation of equipment and so forth). It is natural that the actions of the pilot were impeded, and his attention and speed of reaction became insufficient for timely reaction to the indications of the individual instruments, and even less so for complex indications. Thus, in carrying out a blind landing, the pilot had to simultaneously observe the indications of six instruments, without considering periodic checking of flight speed, engine operation and so forth. According to the indications of the instruments, he had to keep the aircraft in a determined position. For a man to solve such a problem was extremely difficult.

To simplify instrument piloting, special pilot-navigation director systems were built. Utilizing such a system, the pilot controls the aircraft according to the indication of two arrows on the directing device. Holding these arrows in the zero position when landing is the pilots only task. The aircraft will follow the planned glide path exactly if this is done.

The use of radar means has made it possible to automate the process of guiding fighters to aerial targets.

Before the appearance of jet aviation, aircraft piloting could be done relatively easily by hand. The establishing and accustomed standards of controllability (longitudinal and lateral stability, effectiveness of the control devices, pressure gradients in handling the control stick) could be provided in the design of aircraft without particular difficulty[1].

With the increase in altitude and flight speed and their ranges, it became impossible for the design and aerodynamic means to maintain the necessary standards of controllability. At great altitudes, the majority of aircraft had weak damping, inadequate supression of longitudinal aircraft oscillations. It was very difficult for the pilot to combat these oscillations. An aircraft which was stable in subsonic flight, was found to be difficult to control at supersonic speeds, and aircraft which were stable at supersonic speeds could prove unstable at subsonic speeds. The use of swept and triangular wings /323
increased the transverse static stability. This sharply increased the banking moments in slipping. Together with this, the aircraft became unstable with respect to the longitudinal axis at high angles of attack.

To ease the control of the aircraft under these conditions, means of automation were introduced. For aircraft with a low degree of damping, artificial dampers were produced which eliminated longitudinal oscillations of the aircraft by corrections in the position of the controls without the assistance of the pilot and so forth.

The successful fulfillment under the new conditions of combat missions became possible only with sharp work by ground control means and with good systems for launching aviation rockets and correcting their trajectories. Thus, the aircraft became one of the units in a system which consists of three complexes: the ground system, the aircraft and the rocket system. The successes of automation and remote control made it possible to connect all three complexes in a unified working system.

Fighters became an element in a complex system, whose basic units are: radar means and guide points, assuring the interception of aerial targets, the aircraft, carrying out determined maneuvers for approaching the target and launching rockets, air to air rockets and the means of their guidance for the direct destruction of the target.

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[1] Only the provision of amplification on the stick of heavy aircraft which would be acceptable to the pilot called for extremely careful handling of aerodynamic compensation.

Rocket carrying bombers also became just one unit of a system, in which radar means of navigation and bombing assure the arrival of the aircraft at the rocket launching point, the rocket carrier crew fulfills the functions of aiming and rocket launching and air to ground rockets themselves, together with control devices, serve for the destruction of targets.

The combat capabilities of a crew with the aid of radio, automation and remote control, new armament and perfected siting devices have been significantly widened, and the combat effectiveness of the aircraft has multiplied many times.

Aviation science was required to determine the most rational region of application for the growing combat capabilities of the aircraft. It was necessary to determine how to carry out a combat mission in the best and most reliable manner and with the least expenditure of forces and means. The solution of this basic question and several others connected with it occupied a new branch of knowledge, the theory of combat effectiveness.

The growth of this science among us goes back to 1926, when the engineer P. P. Khandozhko by his work laid down the beginnings of the theoretical investigation of air battle. /324 A substantial contribution to the development of mathematical methods for evaluating combat effectiveness in air battle was made by A. N. Kolmogorov. His work, "The number of hits in firing and the general principles of evaluating effectiveness for firing systems" was the basis of the investigation carried out by a group of scholars headed by Ye. S. Venttsel on the question of effectiveness of aviation armament.

A start on the handling of questions of combat effectiveness for the aircraft as a whole was made by the work of V. F. Bolkhovitinov and Ye. A. Anan'yev.

M. L. Mil'

In recent times, aviation science has been given still another task: to make the aircraft capable of using simple airfields. The use in combat circumstances of an aircraft or other flying apparatus which does not require a great airfield with artificial surfaces for landing and takeoff has obvious advantages. Such apparatus can be based at scattered locations and quickly moved behind the ground troops when they are advancing at high speeds.

Attempts to solve the question of takeoff and landing without an airfield began at the dawn of the development of heavier than air flying apparatus. Even then there were the first designs for helicopters. In 1912, B. N. Yur'yev constructed the first helicopter in the world with the automatic skew device which has become a necessary part of the construction in the lifting rotor of almost all helicopters. A. M. Cheremukhin constructed the first

helicopter in the Soviet Union in 1930, the TsAGI-1-3A and his flight on it set a world record for lift height -- 605 meters (the record before this flight was 18 meters).

However, there was no strong requirement for helicopters at that time and no great forces or means were assigned to work on them. Their development was primarily along the lines of aerodynamic and design investigations in the TsAGI. Only in post-war times did the question of vertical landing and takeoff /325
start to receive significant attention, and helicopters began to be improved rapidly. The Design Bureaus led by M. L. Mil', N. I. Kamov and A. S. Yakovlev made a number of domestic helicopters which found application in the civilian economy and in the armed forces of the nation.

But helicopters, which have the ability to takeoff and land vertically have defects, primarily their poor tactical-technical data: a maximum speed of 300 km/hr, a ceiling of 5,900 meters, a range of 1,000 km, a lifting capacity of 10 tons and a weight efficiency up to 15% less than that of an aircraft. Having such technical data, the helicopter cannot compete with the airplane.

How can the positive properties of the aircraft and the airplane be united?

It was found that in many cases and for many types of aircraft pure vertical takeoff was not necessary. For them, short takeoff and landing (100-50 meters) was satisfactory. The design concepts took up this idea. Without ceasing to work on flying machines which did not require airfields, the aviation designers began to develop aircraft with shortened takeoff and landing. According to the new requirements, the scientific institutes found new and effective techniques for increasing the lifting forces in takeoff and landing. Double action thrust flaps, jet flaps which blow away the boundary layer, rotating engines, lift engines and so forth appeared. The successful realization of these ideas occupied the designer of widely famed civilian and transport aircraft, O. K. Antonov. Many Soviet aviation designer began to work on questions of short takeoff and landing.

The scholars made a great contribution to the development of Soviet aviation. They always reacted quickly to the needs of practice and worked out the /326
most realistic, long-range questions. Soviet aviation designers made first class aircraft, engines for them, armament and various types of equipment. Thanks to their forced labors, our nation had and has powerful aviation, which in quality does not lag behind the aviation of any capitalist state.

Now the scientists and designers are working on new problems. They look far ahead. The future of Soviet aviation is in their hands.

The Birth and Development of the Operational Arts and the Military Air Force and the Tactical Types of Aviation Before the Second World War.

With the appearance of aircraft, the question of the combat application of aviation in future wars became a subject of discussion in Russian military thought. In the periodical press, the first attempts were made to plan the combat application of aviation.

O. K. Antonov

Thus, in 1908, when no country had military aviation, the newspaper, "Russian Invalid" published an article, "On the military significance of aeroplanes". In this article the necessity was pointed out of establishing an air fleet which would have the latest types of aircraft: reconnaissance aircraft, fighters, bombers and postal aircraft. Here the authors formulated the mission of aviation: to conduct reconnaissance, to provide artificial illumination of areas at night, to correct the fire of artillery, to provide communication, to bomb and strafe ground and sea targets, to battle the aircraft, dirigibles and balloons of the enemy. In the article it was affirmed that with the application of aircraft, "The war in the air for the mastery of the state in the aerial elements must inevitably catch fire."

In Russia the first attempts to apply aviation to military purposes were made in the maneuvers in the Peterburg, Warsaw and Kiev military districts in 1911 (one aviation detachment on each side).

The aviation detachments in the maneuvers were given the following basic missions: conduct reconnaissance of the enemy, accurately determined his fortifications and photograph them, support communications, do material or morale damage to the enemy by throwing explosive substances from above, destroy kites and steerable balloons and enemy aircraft.

The maneuvers conducted demonstrated the good possibilities of aircraft in conducting aerial reconnaissance. They provided a further thrust for the development of aviation tactical concepts. The Russian military theoretician, B. Gerua, in particular, came to the conclusion that "aerial reconnaissance is a valuable gift of technology to the contemporary military art... Of two /327
enemies, the victor will be the one whose side has superiority in the number and quality of aerial scouts and the art of utilizing them" [359].

In 1911 and 1912, Russian aviation received its first combat experience in the Balkan War, in which a Russian aviation detachment participated on the side of Bulgaria. During the course of this war, the aircraft made aerial reconnaissance and photographed Turkish positions and bombed them.

The successful actions of the aircraft in war provided an impetus not only for the development of military aviation, but for working out techniques of combat application for new means of armed combat. Procedures were developed from experience for carrying out aerial reconnaissance of various tactical objectives. The principle of surprise aviation operations began to be put into effect. The approach to the object to be scouted or bombed was made in

concealment, with the sun behind the aircraft or sometimes from behind mountains or forest masses.

Together with the development of techniques for the combat application of aircraft, Russian military thought firmly sought ways and techniques for counteracting the flying machines of the enemy.

The calculations and practical flights of the outstanding Russian pilot P. N. Nesterov were the basis for the development of tactical air battle. Another Russian pilot, later a commander of a combat aviation detachment N. A. Yatsuk wrote the first military aviation book in history on questions of aerial tactics. In this book, he calls upon the pilots to act with initiative and persistence, striving to destroy the flying machine of the enemy or at least prevent it from coming into their own area.

In the operations of the First World War, the theory and practice of military actions by aviation received further development. At the start of the military operations, aviation performed basically only aerial reconnaissance. Army air reconnaissance was made in the course of two to three passes in the depth of the enemy's positions, in order to get the fullest possible orientation for army staff about all changes in the situation. As a rule, reconnaissance flights were made by groups of aircraft, in which one crew carried out reconnaissance and the others provided cover; with powerful enemy antiaircraft defense under conditions of positional war, the depth of reconnaissance was reduced to 50 to 40 km and was limited to the most important directions.

After the first air battle in the world by the outstanding Russian pilot P. N. Nesterov, rapid development took place in questions of the combat application of fighter aviation, whose mission was to protect the troops and objectives in the rear from attack and reconnaissance from the air, cover the actions of its own reconnaissance aircraft and bombers, hunt down aerial enemies and destroy enemy anchored balloons. /328

In carrying out these missions, fighter aviation began to apply the following techniques of combat operation: intercepting enemy aircraft from the positions "on duty at the airfield" and "on duty in the air", directly escort bombers and scouts, covering them in the area of combat operations, and also free flights to seek out and destroy the aerial enemy.

The struggle for mastery in the air was conducted primarily by annihilating enemy aviation in aerial battles. The destruction of enemy aircraft on the airfields was not widely applied.

Russian pilots, generalizing the experience of the war, continued the development of tactics for aerial combat. Outstanding theoretical work in this area were the brochures published in 1917 by Ye. N. Kruten', "Aerial combat", "Types of fighter apparatus", and others. In these works, the author, basing himself on his combat experience, described the basic tactics of aerial combat, whose basic point was to approach the enemy at the closest possible range by a skillful and surprising maneuver and knock out the enemy aircraft with a short burst.

In theory and practice, there is a noticeable tendency to mass the forces of fighter aviation in the most important directions.

Under conditions of a quantitative increase in enemy aviation, the necessity arises for mass application of fighters. In connection with this, front fighter aviation groups were established in the Russian army (from four to eight detachments).

Bomber aviation was drawn into striking blows at the troops and technology of the enemy, at crossings, railroad stations, airfields and military industrial objectives, and also in the conduct of aerial reconnaissance.

At the beginning, bomber operations were carried out by day by individual aircraft and small groups.

The instruction for the application of aviation in war, published in 1916, pointed out that the greatest results in action against ground targets were achieved by organizing group attacks, ensuring surprise and coordinating the blows of aviation with the operations of ground troops.

In connection with the growth of enemy fighter opposition, the bombers began to operate at night, and from 1917, bomber aviation carried out combat missions under fighter cover. The basic techniques of bomber aviation combat operations became echelon operations and coordinated blows. /329

As has been noted earlier, Russian aviation had the first special bombing squadrons in the world, equipped with the heavy aircraft "Il'ya Muromets". These squadrons were not only a powerful combat means, but a unique scientific laboratory, in which techniques of striking bombing blows at the enemy and tactics of conducting defensive aerial combat were worked out and applied in practice. Here the original bomb sites were developed and the foundations of aerial navigation and guidance were provided.

Thus, the basic elements of tactical reconnaissance, fighter and bomber aviation were borne in Russian aviation in the years of the First World War.

From the experience of the war, the first official documents regulating the combat activities of aviation were developed.

After the Great October Revolution there was a wide expansion of Soviet military aviation construction. Based on the violent development of military air forces, the tactics were perfected for various types of aviation, and then a new branch of military knowledge appeared, the operational art for military air forces.

The basic character and specific situation in which it was necessary for the units of the Red Air Fleet to operate in the years of the foreign interventions and civil war required the development of new tactical procedures and techniques of operation together with those which had already been mastered by Russian aviation in the imperialist war.

In the battles over Kazan' the Red pilots of the First Soviet Aviation Group successfully applied group flights not only for reconnaissance, but also for bombing; in the future, group flights began to be used by other aviation detachments as well.

Attack operations were developed, in particular firing while diving at enemy troops.

The fighters of the First Aviation Division in operations on the Western Fronts, began to intercept enemy reconnaissance aircraft from landing fields directly behind the front lines.

In order to protect the flights of the heavy ships, "Il'ya Muromets" from opposition by enemy fighters under simple meteorological conditions, fighter cover was used. In complex meteorological conditions the Il'ya Muromets aircraft were able to make flights to destroy objectives deep in the rear of the enemy alone. An example of such operations was, in particular, the flight of pilot A. K. Tumanskiy on the aircraft, "Il'ya Muromets" on 8 September 1920, when under conditions of limited visibility due to rain, he struck a blow at the enemy airfield and destroyed four aircraft of six at the station. /330

During the course of the Civil War, our pilots had to carry out communications with the troops and support the combat operations of the garrisons surrounded by the enemy.

In the tactics of aerial combat, the Soviet fighter pilots successfully continued the glorious traditions of Nesterov and Kruten pressing the combat enemy to battle even when he had numerical superiority and striving to attack the enemy by surprise, using a superiority of altitude.

Together with the perfection of tactics, some elements of the operational art of military air forces were borne in the years of the foreign military interventions and the Civil War.

The principle of massing aviation forces in the most important directions and in carrying out the most important missions was sharply expressed.

The maneuvering character of the war and the frequent changes of situation produced an extremely high requirement for organization of coordination between aviation and ground troops. This coordination was achieved by giving concrete missions to the aviation detachments from the overall troop command, to conduct aerial reconnaissance, strike bombing blows at troops and objectives in the enemy rear and cover their own troops. In some operations, special documents were developed which regulated the order of interaction between aviation and ground troops.

An example of the establishment of missions for the coordination of aviation and ground troops can be taken from the directive of the command of the 13th Army on the Southern Front on 25 August 1920. In this directive, it was ordered, "Tomorrow the 26th of August in the morning, the squadrons of our aircraft will cooperate with the advancing infantry and cavalry units, which

will be done by bombing and firing machine guns from low altitudes. Approaching the front lines, our aircraft will make one circle and open machine gun fire immediately, coming down to 300 to 400 meters. At the time of their descent, the intensity of fire of our artillery will be increased to the maximum and our horse and infantry will advance. Wide use is to be made of the attack of our squadrons to approach the enemy and strike him a blow" [360].

Questions of the tactics and operational application of aviation were generalized in the field manual for aviation and the aeronautics instructions for the application of aviation in maneuvering war for the workers and peasants Red Army, developed and published in 1919. This was the first official publication which reflected the basic military art of military air forces, which was borne in the years of the foreign intervention and the Civil War. /331

In the interval between the Civil War and the Second World War, the development of military aviation was accompanied by the development and improvement of the theory of its combat application.

In 1924, a plan for aviation instructions in the workers and peasants Red Air Fleet was worked out. The book by A. V. Sergeyev, *Strategiya i taktika Krasnogo vozdushnogo flota*, [Strategy and Tactics of the Red Air Fleet], published in 1925, must be considered an interesting work on questions of the operational application and tactics of military air forces, in which the experience of civil aviation is generalized and recommendations are made for ways of developing methods of combat application for aviation. In the same year, in the journal, "Vestnik Vozdushnogo Flota", a work by corps commander V. V. Khripin, "Questions of strategy and tactics of the Red Air Fleet", was published.

V. V. Khripin

Further development of questions of operational application for aggregations and groupings of military air forces was assured by the qualitative growth of aviation technology, the appearance of improved aircraft, armaments and equipment by the standards of that time and the foundation in the military air forces of aviation brigades of heavy bombers, light bombers, attack bombers and fighter aviation, and also aviation corps and aviation army reserves of the Supreme Command.

A special place in the development of the theory of operational application of aviation is occupied by the works of Marshal of the Soviet Union M. N. Tukhachevskii.

On 11 January 1930, M. N. Tukhachevskii in the speech on the reorganization of the Armed Forces, recommended an increase in the number of divisions and the continued development of artillery, aviation and tank troops.

In February of 1934, M. N. Tukhachevskiy with I. P. Uborevich, in a letter in the name of the Peoples' Kommissariat for Military and Naval Affairs, wrote "...Contemporary aviation can disrupt railroad transport, destroy military stores and interfere with the mobilization and concentration of troops at long ranges... The side which is not prepared to destroy the aviation base of the enemy, to disorganize his railroad transport by systematic aerial attacks, to disrupt his mobilization and concentrations by numerous aviation landings, to annihilate his stores of fuel and military supplies, to destroy enemy garrisons and echelons by swift actions of mechanized units, supported by cavalry and infantry in trucks, this side risks being subjected to destruction" [361]. Due to this, the authors of the letter considered the basic decisive factor in the development of the workers and peasants Red Army in the immediate future years to be the rapid development of aviation. /332

In the article, "New questions of war", M. N. Tukhachevskiy, discussing concrete ways of perfecting aviation technology and pointing out the uninterrupted growth of the combat effectiveness of aviation, gives an account of the basic questions in the operational application of aviation and confirms the growing role of aviation, the capability of aviation to undertake important operational missions and to serve as a means for landing troops in the enemy's rear [362].

In the mid-30's, based on the works mentioned above, Soviet military scientists finally crystallized an orderly theory of operational art for military air forces, which analyzed questions of preparing and bringing into combat operation aviation organizations and groupings to carry out operational and operational-strategic missions.

Our outlook on the application of aviation came from the basic contention of Soviet military doctrine, that victory in combat and operations is achieved by the coordinated forces of all types of armed forces and all kinds of troops. At the start of the Second World War the military air forces included short-range bombers, attack bombers and fighter aviation. All these types of aviation were designed for coordinated operations with ground troops. Long range bomber aviation, as a means of the Supreme Command was assigned to operate against objectives deep in the rear, and only under special circumstances was it brought into action against enemy troops on the battlefield. Military Naval Fleet aviation was intended to support and cover the fleet ships.

The plan of the field regulations for 1939 allowed for independent conduct of aerial operations by aviation, however, its most important mission was considered to be contributing to the success of ground troops in combat and operations. In this, it was pointed out that aviation is a powerful means for attacking enemy troops and technology, annihilating his aviation and destroying important objectives. /333

Great attention in the theory of the operational art of military air forces was assigned to an investigation of the techniques of organization and conduct for independent aerial operations. There was wide discussion of the problems of carrying out aerial operations to gain mastery in the air, to disrupt railroad, sea, river and motorized transport of the enemy and to destroy

the naval forces of the enemy by the reserve aviation armies of the Supreme Command independently, and in cooperation with the military air forces of the fronts. Together with this, there were investigations of the techniques of long-range bomber aviation operation against important political economic centers of the enemy. In 1936, all theoretical investigations and experience of line units in questions of preparing and conducting aerial operations were generalized in the form of practical recommendations to the troops given in the provisional instructions for independent operations by air forces of the workers and peasants Red Army.

In front line advancing operations, aviation was required to carry out the following basic missions: strive for mastery of the air by annihilating enemy aviation on the ground and in the air; cover its own troops and objectives; support the troops in breaking through to the tactical rear of enemy defenses and in pursuing the enemy in the operational rear; struggle against enemy reserves; secure the placement of aerial landings and support their combat activities; supply troops from the air and conduct aerial reconnaissance. To perform these missions, it was considered necessary to have a significant quantity of aviation at the front.

One of the basic requirements for Soviet military art on the eve of the Second World War was the mass application of aviation and the coordination of its forces against important objectives. Therefore, in the plan of the field regulations for 1939, it was stated that "To achieve maximum combat success military air forces must be applied massively", and the necessity of coordinating the aviation forces at targets, "which at the given stage of combat have the most important significance, are the major objective of troop action and can interfere with the performance of the combat mission" was confirmed.

Soviet theory assigned great significance to uninterrupted action from the air against the enemy troops. To achieve this, it called for aviation operations in the period of preparation for attack operations as well as during the operations. In the period of preparation for operations, aviation was required to disrupt the movement of troops and material technical means by /334
the enemy, exhaust his troops on the battlefield, disorganize the direction of enemy troops and conduct aerial reconnaissance. From the start of the operation, it called for the conduct of aviation preparation for the advance, which should be either before the artillery preparation or at the end of it, in order to coordinate the strike of bombers against the defensive armament, artillery and troops of the enemy in the direction of the main blow. These objectives were to be selected no closer than one kilometer from the line of military contact.

When breaking through enemy defenses and developing an advance, front aviation and first of all bombers, was required to isolate the area of struggle from the approach of all kinds of reserves, support the troops in overcoming intermediate lines in the operational rear, battle the retreating enemy troops, cooperate in surrounding and finally annihilating the enemy, support tanks and cavalry organizations in the operational rear and conduct aerial reconnaissance.

From the experience of the Soviet Finnish War, it was concluded that it was

necessary to divide aviation into army aviation, specially assigned for cooperation with ground troops, and front aviation, operating on the plan of the front or the headquarters of the Supreme Command in the interests of operations and the war [363].

A. N. Lapchinskiy

In this it was considered that army aviation must have chast's and aggregations of reconnaissance, forward observer, attack bomber, light bomber and fighter aviation. At the end of 1940, it was considered that a general troop army, acting in a major direction must have two to three mixed aviation divisions. Among the troop formations of a front, it was planned to have primarily bomber chast's and aggregations. /335

As subsequent experience showed, the assignment of significant aviation forces to general troop armies was not completely well founded. At the time of the Second World War, it was necessary to unite all aviation in the formations of a front.

In 1939, Professor A. N. Lapchinskiy in his work, "The air army" made a detailed development of the problems of struggle for mastery in the air. To achieve the most complete results of struggle with enemy aviation, it was planned that aerial operations be conducted to destroy enemy aviation with the participation of the military air forces of several fronts and the aviation reserve of the Supreme Command. Together with this, such forms of struggle as systematic military air force operations to destroy and supress the aviation of the enemy at airfields and in the air were not excluded.

In the pre-war years, questions of the application of aviation in the initial period of war were worked out.

The most complete mission of aviation in the initial period of the war was determined by corps commander V. V. Khripin and Colonel P. I. Malinovskiy in works written in 1936 [364] The basic missions of the military air forces in the initial period of the war were considered to be the suppression of the air enemy at all depths of his distribution, in order to win mastery in the air, disrupt the coordination of enemy armies, support with a portion of the power of aviation the combat operations of the leading armies of ground troops.

Together with these basic missions, the necessity was not excluded of operations against economic and political centers of the enemy in order to suppress and destroy them, considering that these actions would have an effect not only on the course of the initial period, but on the outcome of the war as a whole.

The military literature considered concrete measures to raise the combat readiness of aviation in close connection with the operations of military air forces in the initial period of war. In particular, Professor A. N. Lapchinskiy recommended the timely removal of aviation chast's aggregations from permanent airfields to field airfields to conserve aviation in the initial period of a war.

By 1940, the tactics of bomber, fighter and attack bomber aviation were worked out and practically tested.

A significant contribution to the development of aviation tactics was made by A. N. Lapchinskiy and A. K. Mednis, and also by the professor-instructor staff of the command faculty of the Professor N. E. Zhukovskiy Military Air /336
Academy. In 1940, combat regulations were published for the basic types of aviation. In these, a great deal of material on the tactics of bombers, attack bombers, fighters and reconnaissance aircraft was generalized.

The combat regulations for bomber aviation considered questions of the combat application of bomber aviation and its direction in carrying out various missions. Depending on the circumstances, the regulation called for two techniques of bomber combat operation: coordinated blows, struck by several squadrons or a regiment at large troop groupings or important targets, and echelon operations of small groups (squadrons, units and individual aircraft) against troops on the battlefield.

In striking bomber blows, it was recommended that great attention be paid to concealment and a surprise approach to the target. For this purpose, the regulation called for flights at high altitudes and speeds, behind clouds and in clouds, away from strong points and communications lines and the application of broken routes. The altitudes for operations above the battlefield were established: by day from 3,000 to 7,000 meters, by night from 600 meters and above. If necessary, operations at low altitudes were called for by special details of fighters or attack bombers to destroy the antiaircraft artillery of the enemy.

In the combat regulation for fighter aviation, it was pointed out that this is the chief means of struggle with the aerial enemy and has its basic mission in the annihilation of the enemy in the air and on the ground.

The techniques of combat operation for fighter aviation depended on the specific mission being performed. In covering troops and objectives, "Patrolling in the air" and flights from the condition "on duty at the airfield" were called for. It was recommended that patrolling be resorted to if the aerial observation, warning and communication service were poorly organized and sufficient fighter strength were available. It was pointed out that normal patrolling should be on three levels: at altitudes of 600, 2,000 and 3,500 meters. To battle aerial reconnaissance, it was recommended that it be kept on the ground. Fighter security for other types of aviation was called for by direct aircraft escort to the target and back.

It was recommended that fighters in the air be directed by aircraft

maneuvers, signals placed on the ground and radio, with the use of code. Radio was not yet the basic means of direction for fighter aviation.

The plan of the 1939 field regulation stated that the basic mission of attack bomber aviation was the destruction of enemy troops and materials on the battlefield and in the rear. The foundation of attack bomber aviation, /337
equipped with R-5 aircraft, SSS and I-15bis fighters, was to strike blows in low level flight with one pass at maximum speed. In individual cases, the possibility was foreseen of striking a blow from low and medium altitudes.

Thus, a fairly orderly theory of the operational and tactical application of aviation was worked out in the pre-war years. The basic positions of this theory were confirmed by the experience of war. Together with this, the years of the Second World War required the introduction of well known corrections in our opinions about the role and purposes of aviation and the character of its combat operations.

Infantry Tanks and Aviation Advancing on Maneuvers in the Summer of 1930.

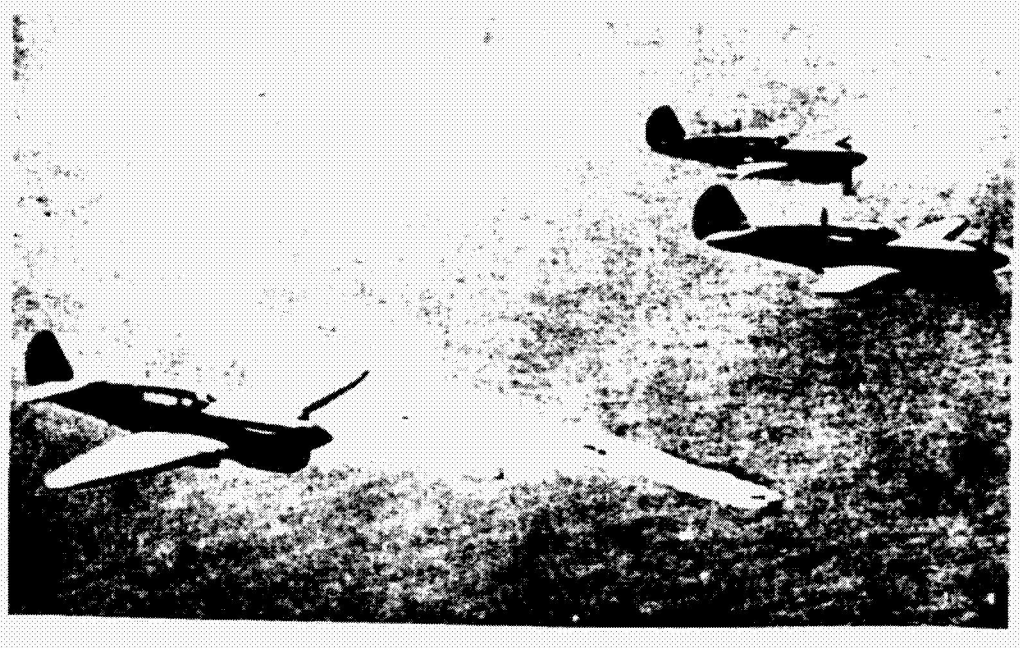
Operational Art of Military Air Forces and the Tactics of Types of Aviation in the Second World War

Destroying a dangerous air enemy and annihilating many troops and much enemy technology, the Soviet military air forces made a great contribution in achieving the victory of the Soviet people in the Second World War. The effective operations of aviation clearly indicated the high level of combat art in the Soviet military air forces.

The operational art of the military air forces and the tactics of all types

of aviation made a great step forward at the time of the war. The development of the theory of combat application of aviation proceeded, based on the qualitative and quantitative growth of the military air forces, and also under the influence of combat experience, obtained by our pilots and aviation commanders. The high morale combat spirit of Soviet aviators generated a striving to fulfill combat missions in the best possible manner.

Putting Down a Landing Force.



Fighters of the Black Sea Fleet Cover a Torpedo Boat in 1944.

The operational arts of the military air forces and the tactics of various types of aviation were distinguished by their creative character, great flexibility and dynamism.

The Second World War was a severe test of the positions of Soviet military doctrine on the application of aviation in operations, battles and war as a

whole. The experience of the war basically confirmed the correctness of our pre-war opinions that military air forces should be used for coordinated operations with ground troops and the military naval fleet, and also for independent operations deep in the rear of the enemy to carry out operational strategic missions in the interests of strategic operations, campaigns and the war as a whole.

Under the Cover of Aviation.

During the course of the Second World War, the military air forces were used to carry out the following basic missions: cooperate with the ground troops and the Military Naval Fleet in annihilating the basic groupings of enemy ground troops and the enemy fleet; struggle for mastery in the air; /338 destroy administrative political and military industrial centers, and also communications channels in the operational and deep rear of the enemy; protect important military objectives from the air; conduct aerial reconnaissance; transport troops and cargoes by air and aid the partisan movement.

The basic efforts of the military air forces in the first days of the war were directed towards cooperation with ground troops and the Military Naval Fleet.

According to our pre-war theoretical positions, success in the application of aviation in cooperation with ground troops and the fleet had to be achieved by massing powerful aviation forces in the decisive direction. The correct utilization of this principle ensured the success in military air force operations throughout the war. Thus, for example, at the end of 1941, in the culminating period of the battle before Moscow, 40% of the military air forces of the Red Army were concentrated. This made it possible to achieve superiority of forces in the major direction and earn operational mastery in the air.

The concentration of aviation efforts in the direction of the major blows in the campaigns or strategic operations from 1942 to 1945 took place on an ever greater scale. Concentration of forces was achieved by interfrontal

maneuvers of aviation aggregations from the Supreme High Command reserve, and also by bringing the basic forces of long-range aviation to bear in the major directions. Thus, the counterattack before Kursk and the Belorussian operations drew in up to 40% of all front aviation and all the long-range aviation. In January of 1945, along the major Warsaw-Berlin direction, in a 550 km belt forming 25% of the length of the entire Soviet-German front, 43% of all the aircraft in the Soviet military air forces were concentrated.

On the basis of experience in advancing operations, the most expedient techniques for supporting ground troops in the destruction of powerful enemy groupings were found. Aviation was found to be an effective means for supporting ground troops in developing attacks at great depth and high speeds. The skillful application of air armies in coordination with tank armies made it possible to strike deep and decisive blows at the enemy.

In the course of the Second World War, questions of the organization and conduct of struggle for mastery in the air received further development. Winning mastery in the air was considered by our military theory as one of the most important tasks of armed struggle, to be decided by the efforts of all types of armed forces with a leading role for the military air force. The experience of the war demonstrated with full conviction that defeating the enemy/339 on the ground is possible only after having won mastery in the air.

M. N. Tukhachevskiy

In the struggle for mastery in the air, in addition to the military air forces, which struck the most powerful blows against enemy aviation in the air and on the ground, the ground troops, military naval fleet and air defense troops of the nation participated. In several advancing operations, tank aggregations captured airfields of the enemy and destroyed aircraft and flight technology equipment on them. Near the seas, enemy aviation at the airfields was destroyed by artillery fire from fleet ships. In a number of cases, sea and air landings, as well as partisan detachments, were used to capture airfields.

Great attention was paid to developing techniques to protect military industrial and administrative centers and important economic regions (Moscow, Leningrad, Gor'kiy and others) from the blows of enemy aviation. The basic technique for covering such objectives was fighter aviation, closely cooperating with anti-aircraft artillery. Fighter aviation was given great initiative in operations both on the approaches to defended objectives and over the objectives. With the arrival of the first radar station in the armed forces at the end of 1942 and the beginning of 1943, the practice of covering important objectives by the technique of keeping fighters on duty at airfields began.

In the years of the war, two types of struggle for mastery in the air were used: the first was the annihilation of enemy aviation within the framework of advancing and defensive operations by ground troops; the second was special air operations.

In the course of the war, the theory and practice of organizing and conducting aerial operations received further development. They were conducted on a unified concept in plan over a wide front with the involvement of powerful /340
forces of front aviation, long-range aviation and Military Naval Fleet aviation. The headquarters of the Supreme Command was the organizer of the operations. Their goals included the destruction or weakening of opposing enemy aviation groupings by destroying aircraft on the airfields and in air battles.

The greatest aerial operations in the Second World War were the operations to destroy enemy aviation, conducted on the central portion of the Soviet-German front in May and June of 1943. These operations were distinguished by the decisiveness of the target, great scope and high effectiveness. The blows struck against fascist aviation in these operations largely predetermined the conquest by Soviet aviation of stragetic mastery in the air in the summer of 1943. The experience in conducting them was applied as the basis of further development in the theory of organization and conduct of air operations.

In the course of the war, long-range aviation periodically struck blows by night at the administrative political centers and military industrial objectives of the enemy and was widely used to disrupt communications paths in the operational rear of the enemy. Techniques were worked out for striking massive blows at large railroad junctions and echelon blows at railroad crossings, in order to break up and destroy enemy transportation. Striking such blows made it impossible for the enemy to concentrate his material means and troops in important directions in a timely manner. Striking blows at seaports and military naval bases of the enemy was also done successfully, as a result of which the planned supply of his troops was broken up.

Techniques were developed and mastered for conducting aerial reconnaissance deep in the enemy rear. Particular attention was given to the reconnaissance of regions of probable concentration for large enemy reserves, his airfield net, military naval bases, ports and also railroad and sea communications. Eleven percent of all aircraft flights by front aviation were made to carry out aerial reconnaissance. To increase the reliability of aerial reconnaissance data, wide application was made of photography on important objectives. In 1941, photographic flights were about 10%, in 1942, about 26% and in 1945, almost 87%.

In the war years, the application of aviation as an important transport means for supplying the troops with cargo, supporting partisans and evacuating wounded and sick was mastered in practice. A great role in the successful application of transport aviation was played by the development of more rational techniques of flight for single aircraft at night and in complex meteorological conditions deep in the enemy rear, with landings on airfields of /341
limited dimensions, and also for the dropping of cargoes and people by parachute. Much creativeness and inventiveness was displayed in securing landings

and takeoffs of transport aircraft from such airfields.

The successful application of military air forces was to a significant degree determined by the expedient organization of the control system. The basic orders on the characteristics of application for military air forces and the missions to be carried out by them in various operations came from the headquarters of the Supreme High Command. The combat operations of aviation were, as a rule, subordinated to the overall concepts of strategic operations. The headquarters of the Supreme High Command determined the bases of coordination among the air armies of various fronts in the course of strategic operations, and also establish the rules for coordinating aviation with ground troops and with the Military Naval Fleet. By a decision of the headquarters, maneuvers of aviation forces on an interfrontal scale were set up.

The commands of the military air forces of the fronts (in the first period of the war), and then of air armies, provided centralized control of aviation on the scale of the front. Coordination of the forces of neighboring air armies was provided by the representatives of headquarters for aviation.

During the war, the flexibility of control for aviation aggregations, chast's and podrazdeleniyes increased many times. Combat orders and dispositions were distinguished by brevity. By radio, they reached the subordinates quickly. Radio became the basic means of control. Aviation commanders at the command points of general troop leaders close to the front lines understood the situation well. They themselves saw the results of operations by the crews and could constantly influence the course of events.

Rigid centralization in conjunction with flexibility and variety in the forms of control depending on the specific circumstances made it possible for aviation to quickly handle missions as they arose and concentrate efforts on the destruction of the most important objectives.

The theory and practice of organization and conduct for combat operations by front aviation in advancing and defending operations improved uninterruptedly. At the end of the first period of the war, a new form for the application of aviation in attack operations was adopted. It received the designation -- aviation advance.

Initially, an aviation advance included only missions carried out by aviation in breaks by front-line troops through the main defense belt of the enemy, i.e., it was conducted only on a tactical scale. In the second and third periods of the war, the framework of aviation advances widened. The aviation advance began to be carried out over the entire depth of the advancing /342
front operation and took on operational dimensions. The aviation advance included all missions carried out by the air army in advancing operations. Such missions were: covering strike groups of front troops from the air; providing support to the army in the first echelon on the front in breaking through defenses; securing the delivery to the struggle (breakthrough) of mobile groups and their operations in the operational depth; struggle against enemy reserves and aviation pursuit of his retreating troops; the annihilation of surrounded groupings of the enemy and blockading them from the air; the conduct of aerial

reconnaissance. In several operations, aviation was used also to supply the troops of the front (particularly mobile troops) and partisans from the air.

The actions of aviation in advancing operations began, as a rule, with the conduct of an aviation preparation, which was divided into a preliminary and direct preparation. The preliminary aviation preparation attack, whose purpose was the destruction of long time defensive installations and the break up of fire systems, was carried out primarily by the forces of long-range and front bombers and only in those cases where the troops had to break through defenses of the fortified region type (the Vyborg operation of 1944, the Koenigsburg operation of 1945).

The techniques of providing direct aviation preparation improved steadily throughout the war. The basic technique up to 1943 was the concentrated blow by the forces of an aviation regiment -- division. In the operations of 1944 and 1945, when the formations of the air army significantly increased and the defense of the enemy was strengthened, mass blows began to be applied, in which several aviation aggregations participated.

The main forces of front aviation were directed to providing aviation support for the troops in breaking through the tactical defenses of the enemy. In the operations of the first period of the war, aviation support was provided by the limited forces of aviation acting against more remote objectives, since there was no radio communication to control aviation above the battlefield and the commanders and staffs lacked experience in the organization of accurate tactical coordination with the troops. In 1943, aviation support began to be provided by more powerful aviation forces, striking blows at objectives directly before the advancing troops. However, in this period, the force was still not sufficient for simultaneous action at all depths of enemy tactical defense. Such capability appeared only in the operations of 1944 and 1945, when the aviation aggregations providing aviation support began to strike blows /343 at objectives both directly before the advancing troops and in the depths of the defense.

Using the results of powerful aviation action against the enemy in the period of aviation preparation and support, the land troops significantly stepped up their speed in overcoming the enemy's tactical defenses.

During the Second World War, theoretical and practical solutions were found for such an important and new question in the operational application of military air forces as aviation provision for the introduction of mobile groups from the front into the breakthroughs, in which these were most frequently tank armies. The introduction of a tank army into a breakthrough was provided for by the basic forces of the air army. At that moment, the fighter aviation cover of the tank formations was strengthened and the enemy airfields were blockaded. Directly before the introduction there was a short but powerful aviation preparation to suppress and annihilate centers of resistance, strong points and particularly means of enemy antitank defense in front and on the flanks of the tank army. Attack bomber aviation constantly escorted the tank formations in the successes they developed in the operational depths. Aviation carried on an active struggle with the outstanding operational reserves of the ene .

In several deep operations at significant separation of the tank army formations from their own rear, particularly under muddy weather conditions, tank armies and their individual groupings were supplied from the air with fuel, ammunition and other materials.

In defensive operations, the primary forces of the military air force were directed toward annihilating the troops and technology of the enemy and battling his aviation. Aviation operated under extremely high stress in the period of struggle for the main defense belt. Great attention began to be paid to the organization of counter-preparation aviation, with the purpose of causing maximum destruction to the main grouping of the enemy, concentrated for the attack.

One of the most important missions of aviation in defensive operations was support of counterblows.

During the Second World War, the tactics of different types of aviation developed significantly. Under the influence of new aviation technology, the combat orders, altitudes and techniques of combat operations for aviation chast's and podrazdeleniyes in all types of aviation were changed.

The rapid development of fighter aviation tactics was caused to a significant degree by the fact that fighters played the chief role in annihilating German fascist aircraft. They acted under great stress and carried out the most various missions under different conditions and circumstances.

The use of cannon armament and the increase in the one second burst rate /344
of new types of aircraft (Yak-3, Yak-9, La-5, La-7), made it possible to cut in half the forces required to annihilate an enemy aircraft. Under conditions of high speed flight, it became necessary to spread the combat formations in space, in order to provide high maneuverability for groups and individual aircraft in air battle. In connection with this, the fighters went from a three airplane unit flying in a compact formation to a four airplane unit consisting of two pairs, operating as separate combat orders and increased distances. The combat orders of the squadron and regiment began to be echeloned along the front, in depth and by altitude, and they now consisted of several groups with different tactical purposes (strike group, cover group, reserve).

Under the influence of new aviation technology, there was a sharp change in the character of air battle. Having a superiority in speed, altitude and maneuverability, our pilots found it relatively easy to get behind enemy aircraft and open fire from short distances, not exceeding 100 to 150 meters. This sharply improved the efficiency of the first attack, in which up to 75% of enemy aircraft were shot down. The efficiency of aerial battles grew also thanks to the improvement in control means. With the aid of ground radio and radar stations, the guidance of fighter aircraft to the target from the ground was organized. The application of radio communications between aircraft improved coordination in groups.

Along with the annihilation of enemy aircraft in the air, fighters were drawn into actions against ground targets and aerial reconnaissance throughout the war. They were found to be an effective means for attacking enemy troops on the march and in regions of concentration, and also when being moved on railroads and truck transport. In carrying out such missions, the "hunt", the free seeking and annihilation of targets, was widely used.

The development of attack bomber aviation tactics included primarily working out the most rational techniques for attack bomber operations in annihilating enemy objectives on the battlefield in close tactical support of ground troops. The basic technique for Il-2 attack bomber operations was echeloned blows by groups of four to 12 aircraft. In breaking well prepared enemy defensive positions, concentrated blows by regiments, divisions and sometime corps groups were also used.

The attack bombers widely applied the "hunting" technique, carried out by well trained pairs and units, who successfully annihilated small columns of /345
German fascist troops on the roads, disorganized the enemy rear and destroyed motorized and railroad transport.

If in the beginning of the war, attack bombers struck bombers in horizontal flight at low level flight altitudes (up to 50 meters), later on it was found to be more effective to attack from altitudes of 800 to 1,200 meters in sloping dives. In this case, better utilization was made of all the fire power of the attack bomber aircraft. The accuracy of bombing and strafing was significantly higher.

The results of attack bomber aviation operations were highly evaluated by general troop commands and excited admiration in the soldiers and officers of the ground troops. The accurate strikes of attack bombers inspired the infantry and tankers to better carry out the missions assigned to them.

Short-range bomber aviation was used day and night primarily to destroy tactical objectives on the battlefield. 63% of all its aircraft flights were made at a depth of 10 meters or less from the front line. The night light bombers Po-2 acted under the greatest stress (they made 55% of the total aircraft flights by bombers).

The basic techniques for combat operations by bomber aviation, as predicted in the pre-war regulations, were concentrated and echelon strikes. In the course of the war, these techniques were constantly improved and took on new content. The significance of concentrated blows increased and their scale grew. The delivery of an increasing quantity of Pe-2 bombers made it possible to apply dive bombing widely for the destruction of small objectives on the battlefield.

Along with the support of ground troops on the battlefield, short-range bomber aviation conducted a successful struggle against reserves, railroads, motorized, sea and river transport of the enemy, destroyed control and disorganized the work of the enemy rear, annihilated and suppressed enemy aviation on the airfields and carried out a number of other missions.

Long-range aviation was also used primarily for attack on enemy troops (second echelons and reserves) on the battlefield and in the near rear. According to the pre-war opinions, it was to strike blows deep in the rear of the enemy outside of tactical and operational connection with ground troops. Only in certain cases was it permitted to utilize long-range aviation for the support of ground troops and the fleet. In reality, it was found that 40% of all aircraft flights by long-range bombers during the course of the war were made to annihilate enemy troops and technology directly on the battlefield, 43% of the flights were against railroad objectives and enemy airfields /346 in advancing and defensive operations by the ground troops. Only 3.2% of the aircraft flights were for operations against administration political centers and military industrial objectives deep in the enemy rear.

This situation was explained by the necessity of concentrating all the strike forces of aviation, including long-range bomber aviation, for the destruction of enemy ground troops, without which it would have been impossible to achieve a change in the course of the war and victory over fascist Germany.

In spite of the peculiarities noted in the character of combat application of long-range aviation, its tactics made a great step forward in the war years. Questions of organizing powerful bomber blows by night against objectives near the front line were worked out anew. Techniques of overcoming enemy antiaircraft defense in operations against objectives in his deep rear were improved.

Based on generalizations from war experience and considering the combat capabilities of new aviation being delivered, a number of regulations, instructions and orders, regulating the techniques of combat operation for aviation under various conditions were worked out and issued.

In 1942, guides for the combat operations of all types of aviation were issued. In 1944 and 1945, instructions for the combat operations of all types of aviation were issued. In addition, a number of directives by the commandant of military air forces of the Red Army, issued in the war years, contained instructions on questions of aviation tactical operations. In the periodic press, particularly in the Air Force Newspaper, "Stalinskiy Sokol" and the journal, "Vestnik Vozdushnogo Flota", theoretical articles were published on questions of operational art for the military air force and the tactics of various types of aviation. The authors of these articles were well known aviation commanders and ordinary pilots. The development of operational art for military air forces and tactics for various types of aviation was favorably influenced by the scientific labors of the professor-instructor personnel of the aviation academies and schools, and particularly the Red Banner Military Air Academy (command and navigation personnel). Wide discussion of new problems facilitated increasing the combat capabilities of aviation and the development of theory and practice for combat operations of the military air forces.

Operational Arts of the Military Air Forces and Tactics of Various Types of Aviation in the Post-War Years

In the post-war years, the military air forces were basically changed. In this time, military theory in the area of aviation application changed in a new /347

way and extremely rapidly, and it is still changing. The development of military art for the military air forces proceeded under the influence of rapid technological progress in aviation and other types of armed forces and the revolution in military affairs connected with this progress. The development of operational arts for the military air force and tactics for various types of aviation has been influenced by conclusions from the experience of the war, and also by experience in combat preparation by aviation chast's and aggregations.

The post-war period in the development of the military art for the military air forces can be arbitrarily divided into three stages, corresponding in their content and duration to similar stages in the development of the Soviet Armed Forces.

In the first stage (1946 to 1953) the development of the operational art and tactics for the military air forces proceeded primarily by generalization from the experience of the Second World War, considering the re-equipping with jet aviation technology which had begun.

In the second stage (1954 to 1959) the operational art for military air forces and the tactics of various types of aviation were developed under conditions of the wide introduction of mass destruction weapons and the completion of re-equipment with jet aviation technology.

In the third stage, beginning in 1960 and continuing to the present, there has been and continues to be a stormy development of neuclear rocket armament, which has a decisive influence on the character of future war and the use within it of all types of armed forces, including the Military Air Force. Aviation in this stage has received supersonic rocket carrying aircraft, and the pilots have begun to master cosmic space.

In the first stage, the foundation of the power of the Armed Forces consisted of military technology intended to use conventional means of destruction, but having better quality equipment than the technology used in the preceding war.

As the means of aerial attacks significantly increased, the role of aviation in war grew substantially. Particularly great attention was given to the problem of gaining mastery in the air, since the possession by the United States of America of nuclear armament and powerful military air forces had to be considered. At this time, the theory of organization and conduct of air operations and the application of aviation in aviation attacks received further development. Techniques for striking powerful aviation blows at strategic objectives deep in the rear, first of all at the strategic means of nuclear attack, military economic potential, the government system and military control and troop groupings were carefully worked out.

In order to gain mastery in the air, it was planned that powerful air /348
operations should be carried out. In this, considering the growing vulnerability of aircraft on the ground in connection with re-equipment with jet technology, the most expedient technique of struggle with enemy aviation was considered to be its annihilation on the airfields.

The increase in the speed of flight, particularly in connection with the arrival of the first type of jet fighters, and the equipment of aircraft with various types of radio electronic apparatus brought with it substantial changes in the tactics of various types of aviation.

There was a substantial increase in the role of accuracy in sending out fighter interceptors to attack aerial targets. It became necessary that they be sent out with the aid of radio technological means.

Under the influence of the increasing speed and altitude characteristics of jet aircraft, the reduction of their maneuvering capability and the horizontal plane as compared with piston aircraft, and also in connection with the increasing efficiency of ground antiaircraft defense means of the enemy, the combat order of fighters continued to spread out in space along the front, in depth and in altitude. In working out tactics for fighter aviation equipped with jet aircraft, the experience of military air force operations in Korea was carefully considered.

Bomber aviation achieved the capability of striking blows from high altitudes, frequently against targets which were not visible. Previously, it had been planned to use bombers in powerful groups in plane combat formations. In this it was assumed that bomber aviation would be used to destroy and annihilate the most valuable targets in the operational and strategic rear of the enemy, significantly more widely than it was used in the previous war.

In the second stage, aviation, fully re-equipped with new jet aircraft, was the primary and at first the only means for reaching targets with nuclear weapons. Together with piston attack bombers as front-line aviation, jet fighter bombers appeared, which had better fire capabilities in the support of troops than attack bombers. Simultaneously, various radio technical means were supplied, widening the capabilities of combat application for aviation in complex meteorological conditions and at night. Under the influence of such technological progress, the combat capabilities of aviation grew.

In this, combat capabilities came to be determined not only by the quantity of aircraft, but by the quantity and size of nuclear bombs and the capability /349 of aviation to successfully carry nuclear weapons and destroy targets with great accuracy.

The techniques for annihilating enemy aviation on the ground and in the air continued to be worked out and perfected up to 1959 within the framework of the theory of battle for mastery in the air. However, this battle took on a new character. Its basic tasks were now the annihilation of atomic weapon carrying aircraft on the ground and in the air. The problem of covering troops and objectives in the rear of the front became very real. The basic efforts of fighter aviation were concentrated in the direction of the main strike of ground forces and its control was centralized.

Under the new conditions, the aviation advance as a form of aviation application characteristic of the Second World War, lost its significance. The basic efforts of aviation in the aviation preparation for a breakthrough (attack)

came to be transferred to the depth of the main belt and tactical zone of defense. Aviation support (troop escort) in advancing operations began to be carried out in a new way. The basic efforts of military air forces were now directed toward blows at objectives beyond the range of fire of ground troops. Techniques were worked out for rigid centralization of front aviation control and rapid maneuver of its forces in the course of operations.

In connection with the possible application of nuclear armaments, the development of aviation technology and the further improvement of antiaircraft defense, changes take place in the tactics of all types of aviation. The combat orders of aircraft are ever more dispersed in space. The role of anti-nuclear and anti-chemical defense for aviation chast's and aggregations grows.

In the third stage a very radical change took place and is still taking place in the operational arts for military air forces and the tactics of various types of aviation. The military air forces received new types of aircraft with significantly higher flight tactical characteristics (supersonic speed, great altitude, improved aircraft control instruments and so forth) and new rocket armament (air to air and air to ground). Aviation began to turn into rocket carrying. This significantly increased the combat capabilities of military air forces and made possible more reliable and decisive attacks against basic enemy objectives in the near front area and deep in the rear.

The basic area of application for military air forces under such conditions became the annihilation of small and moving targets. The forces of rocket troops were concentrated on the destruction of stationary objectives. To the degree that rockets began to present the major danger, the term "mastery of the air" in its previous significance failed to express the reality of struggle with/350 the enemies means of neuclear attack and lost its significance. In place of the struggle for mastery in the air there appeared the task of decisive struggle with the enemies means of nuclear attack by destruction of his rocket and aviation groupings. It was accepted that means of nuclear attack must be annihilated as soon as they are discovered. For this the techniques of flight from the duty position at airfields and "hunting" are used.

Military air forces can successfully unite the search for nuclear attack means and their immediate annihilation. In connection with this, it became most characteristic for piloted aircraft to operate to destroy rockets in the starting positions and in movement, since they are small dimensional and moving targets, and also stroes of nuclear weapons and organs of aviation and rocket control.

The annihilation of enemy aircraft at the airfields began to involve ground to ground rockets, since airfields are stationary large scale objects. However, aviation also continues to play a substantial role in carrying out this mission, performing it in close cooperation with rocket troops. It carries out immediate strikes at enemy airfields at which fresh aviation forces are observed.

One of the missions of long-range aviation is the annihilation in cooperation with Military Naval Fleet aviation of the means of nuclear attack at sea, particularly strike aircraft carriers.

For the development of operational arts for the military air forces in the third stage, a characteristic mark was the deep working out of questions of aviation application at the start of war. This was called for by the sharp growth in the influence of armed struggle at the beginning of war on the entire course of the war and its results. If the aggressor unleashes war, our military air forces will begin combat operations on a wide scale and will be one of the basic means for delivering nuclear weapons to targets. In performing operational missions in air operations and in the operations of ground troops, they can efficiently destroy enemy objectives with conventional armaments as well, since they have high maneuverability and will quickly concentrate their forces in the most important directions for the annihilation of the most valuable objectives. Serious attention has been given to the development of techniques for applying the strength and means of military air forces at the start of war.

The questions of fighter aviation application have begun to be solved in a new way. In connection with the appearance among the antiaircraft defense troops of antiaircraft rocket troops, capable of annihilating aerial targets with high efficiency at the near approaches to covered objects and directly above them, fighters, as a high command means, have begun to be concentrated /351
for the annihilation of enemy aircraft on remote approaches to covered objectives. At the same time, it was established that if necessary, fighters can annihilate aerial targets in the same zone with antiaircraft rocket troops in close coordination with them.

Military thought was aimed at working out questions of aviation application as a reconnaissance and transport means. Analysis of the conditions of carrying out armed struggle in a nuclear rocket war showed that all types of armed forces would, to a certain extent, require aerial reconnaissance data, which remains the basic source of rapid trustworthy data about the intentions and activities of the enemy at the rear, on the approaches to the front and directly in the prefrontal zone. The volume of aerial reconnaissance has significantly increased. This is explained by the great dispersion of enemy ground troop groupings both in place and on the move, and by the existence of new objectives of reconnaissance, rocket facilities, which frequently change their location. At the same time, a new consumer of reconnaissance data has appeared, rocket troops, in whose interests, aviation must systematically carry out intensive aerial reconnaissance. Contemporary aviation technology permits the air reconnaissance men to penetrate deep in the enemy rear and discover the disposition of his nuclear facilities and other objectives, immediately transferring data about them to the command points.

The highly maneuverable character of operations, the wide application in them of aerial landings and the great material outlays have made necessary the wide application of transport aviation in military affairs. In connection with this, theoretical investigations were made and practical tests were conducted in troop training on the techniques of making operational and tactical landings, and also on the application of aviation chast's with special transport aircraft and helicopters for the movement of troops and various cargoes.

The delivery to the military air forces of new jet, including supersonic, aircraft, armed with air to ground, air to ship and air to air rockets, the significant increase in enemy antiaircraft defense combat capabilities and the sharp increase in the specific weight of movable objects both in the tactical and in the operational depth, have had serious influence on the development of tactics for types and branches of aviation.

The conversion of long-range aviation to rocket carrying and the presence on the aircraft of air to ground and air to ship rockets with powerful nuclear warheads made it possible for long-range aviation to go over to a new tactic of operations, consisting of launching rockets at the limiting range of action /352 without going into the antiaircraft defense zone of the objective. The area of application of long-range aviation against sea targets has significantly widened, particularly in strikes against enemy aircraft carriers.

The operations of front aviation equipped with supersonic jet aircraft with powerful rocket armaments took on an extremely maneuverable character. For front bombers and fighter bombers it became characteristic to carry out various combat missions in small groups, pairs and by individual aircraft, flying preferably at low altitudes and making complex types of maneuvers. Supersonic fighters with air to air rockets perform the mission of intercepting aerial targets in a completely new way at extremely high and low altitudes.

In our days, when all technology, including aviation, is developing with extreme vigor, there are rapid changes in military aviation theory also, which must look ahead in a timely manner and scientifically base its techniques for applying new types of aviation technology.

At present there is intensive work on the problems of applying aviation in the complex dynamic situation of nuclear war. Techniques of aviation action in operations with conventional means of destruction are also being investigated. Aviation commanders, staff officers and pilots persistently seek the most rational techniques of action for supersonic aircraft. In the aviation academies and schools, in the scientific research organizations and everywhere there is a strong pressure to investigate real problems in the operational arts for military air forces and the tactics of various types of aviation. The principle works aimed at the further increase of the air power of the Soviet state are created by the forces of collectives of military scholars.

The Red Banner Military Aviation Academy has become one of the principal centers of scientific research in the area of military air force application in battles and operations. In the 20 years since the war, 300 scholars-aviators have defended dissertations within its walls. The Academy was the first to begin to publish literature to help line chast's raise the level of operational-tactical preparation of aviation cadres.

Our motherland can take pride not only in the significant successes of the creators of new aviation technology, the glowing records of Soviet pilots and other glorious actions of aviators. In the military air forces of the Soviet Union, a whole Iliad of aviation combat leaders and military scholars have been

educated, complete masters of contemporary military aviation theory who have made great contributions to its development.

* * *

CHAPTER 8

THE BIRTH AND DEVELOPMENT OF ASTRONAUTICS IN THE USSR

ABSTRACT. A history of the development of Space Science in Russia and the USSR is presented. Particular attention is turned to the early stages of rocket development, proving the primacy of Russian and Soviet efforts in this field. The works of Tsander, Tsiolkovskiy and others are described in detail. The feats of the Soviet cosmonauts of recent years are also described, and some technical details concerning boosters and spacecraft are presented.

Contemporary astronautics is a new direction for technological progress and a new victory for the human reason. The establishment and development of astronautics is closely connected with the development of aviation and rocket technology. The construction of cosmic vessels and powerful multi-stage rocket carriers was founded with consideration and wide utilization of the experience and achievements of aviation science and technology. Many discoveries in theoretical and applied aerodynamics, the theory of design strength and the theory of stability and guidance were used in selecting rational combinations of flying apparatus intended for the mastery of the cosmos. The experience of experimental and serial aircraft construction and engine construction, the achievements of aviation instrument manufacture and means of communication guided the creative activity of large collectives, building the technical facilities of Soviet astronautics, on the correct path. Aviation experience in the construction of light and strong thin-walled metal shells, light powerful engines, instruments and systems for flight control, fuel loading equipment and safety systems for pilots played a substantial role in the development of astronautics and facilitated the choice of progressive construction for new flight conditions in cosmic space. /353

Experience in constructing large all metal aircraft was widely utilized in rocket construction in creating new designs for multi-stage rocket carriers.

A number of leading rocket designers in our nation received their education in aviation higher educational institutions, and planned and constructed aircraft of various types.

Academician S. P. Korolev, the designer of a widely famed cosmos rocket system, completed the school of aeromechanics of the N. E. Bauman Moscow Higher Technical School in the years 1929 to 1940 and worked actively in the /354

aviation industry, where he created several models of fast soring lift surfaces.

The experience of pilot aviators was completely transferred to astronautics. The pilot-astronauts, trained in Soviet aviation, quickly mastered the piloting of cosmic vessels and made flights at cosmic speeds under manual control. In our days, pilot-astronauts reliably stabilize their vessels flying in cosmic space, carry out maneuvers, change flight trajectories, leave the vessel in spacesuits into the open cosmos and land their vessels in the assigned region on the surface of the planet Earth.

In the Soviet Union, the experience of training aircraft pilots is widely used in training pilots-cosmonauts. Aviation pilots are the best prepared for maneuvering flights in cosmic space, since they are able to do this in aerial space. The pilot cosmonauts can successfully and reliably solve the problem of continuous work in future orbital stations (the supply of oxygen, food and the necessary materials for work, the replacement of scientific and technical personnel and so forth).

Without good carrier rockets, cosmic flights would be impossible in our time. Only powerful multi-stage rockets made it possible to attain flight speeds on the order of the first cosmic velocity, i.e., eight kilometers per second, and open the era of practical mastery of the cosmos. Useful mutual influences of aviation and rocket technology enrich human thought and lead to new original designs for flying apparatus. According to data in the foreign press, research, experiment and design work is going on in the building of orbital aircraft, flying machines having aerodynamic compositions close to the compositions of a supersonic airplane and flight speeds reaching the first cosmic speed. Orbital aircraft are a synthesis of the best technical achievements in aviation and rocket technology.

The concentration by our nation of significant intellectual and material forces of the Soviet people on the "cosmic front" led to accelerated development of many branches of science and technology. Thus, for example, to observe the flight of cosmic objects and quickly determine the parameters of their trajectories, unique systems of ground radar stations, complex receiving apparatus and automatic computation centers were set up. The perfection of flight control systems led to the development of precision gyroscopy and radio /355
electronics. The development of rocket engine construction gave a powerful stimulus to the development of thermodynamics, chemistry and special branches of physics. Significant forces of scholars and astronomy were involved in the planning of investigations into the nature of the planets of the solar system close to the earth (this branch of astronomy has now become one of the most important and realistic).

Investigations of the physical properties of cosmic space and the conditions of life in cosmic vessels brought new sciences to life: cosmic biology, cosmic medicine, cosmic physics. The science of juridicial standards and the international law of modes of cosmic flight has arisen and developed, cosmic law.

The futher progress of astronautics depends on the development of many theoretical and applied regions of knowledge. Astronautics has posed a number

of difficult new problems in celestial mechanics, aerodynamics, material working, the theory of flight and navigation. Further improvements in rocket engines, flight control systems and systems of cosmic communications and telemetry are necessary.

Soviet scientific technical thought is at the head of progress in contemporary rocket technology and astronautics. It can be recalled, that the first intercontinental multi-stage ballistic rockets were launched in the USSR in 1957; the first artificial earth satellite, the first moon rocket, the first cosmic vessel, the first human flight in the cosmos, the first flight of a three man crew, the first exit of a man into cosmic space, the first soft landing of a cosmic vessel on the surface of the moon and the first artificial satellite of the moon were made by our Soviet state, our Soviet people.

The first flights of maneuverable satellites, the first group flights of piloted orbital vessels and the first guided scientific cosmic stations to the regions of earth's neighbors, the planets Venus and Mars, were also made in the Soviet Union.

The capabilities of such rapid development of various aspects of astronautics in our nation were ensured in the first place by the revolutionary transformation of the old Russian way of life and the significant achievements of socialist science, technology and culture after the Great October Socialist Revolution.

The contemporary achievements of the Soviet people in mastering cosmic space are inseparable from the history of development of science and technology in Russia and the USSR and the history of willed scientific technological progress. We shall briefly consider the basic stages in the establishment of rocket technology and astronautics.

The First Military Rockets in Russia and the Development of Scientific Foundations for Astronautics /356

By the 18th Century, mass production of high quality black powder had been organized and set up in Russia. Russian pyrotechnics made wide use of this powder as fuel for firework rockets. The firework rockets developed by them had deserved world-wide fam . Wide use was made of compound (multi-stage) rockets. The fireworks in Peterburg in the years when Peter the First was tsar were striking by their grandiosity.

At the beginning of the 19th Century, the English General Congrev, having seen the application of powder rockets in India, organized the production of military rockets in England. The Congrev rockets were considered a great English secret weapon and were successfully used in combat operations and wars.

In Russia, the first military engineer to construct models of combat powder rockets was Aleksandr Dmitrievich Zasyadko (1779-1837). He understood that on the basis of the great productive experience of Russian pyrotechnicians, making firework rockets of various calibers by the tens of thousands, it was possible to construct combat powder rockets. These rockets were worked out and

A. D. Zasyadko

constructed under the leadership of A. D. Zasyadko and first began to be used in the Russian-Turkish war (1828-1829). The production of rockets reached thousands per year.

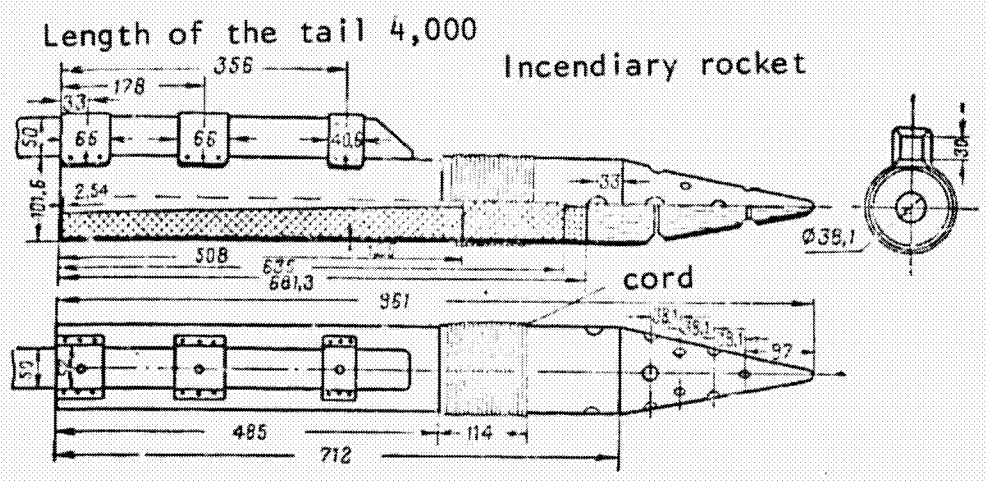
A substantial step forward in the improvement of Russian combat powder rockets was made by the military engineer Konstantin Ivanovich Konstantinov, an outstanding technologist, inventor and organizer of scientific technical investigations in rocket technology. Konstantinov was the author of the great work, *O boevykh raketakh*, [On combat rockets], published in Petersburg in 1864. For more than 20 years, Konstantinov was the chief of the Petersburg Rocket Establishment and introduced great improvements in the process of mass production of powder rockets.

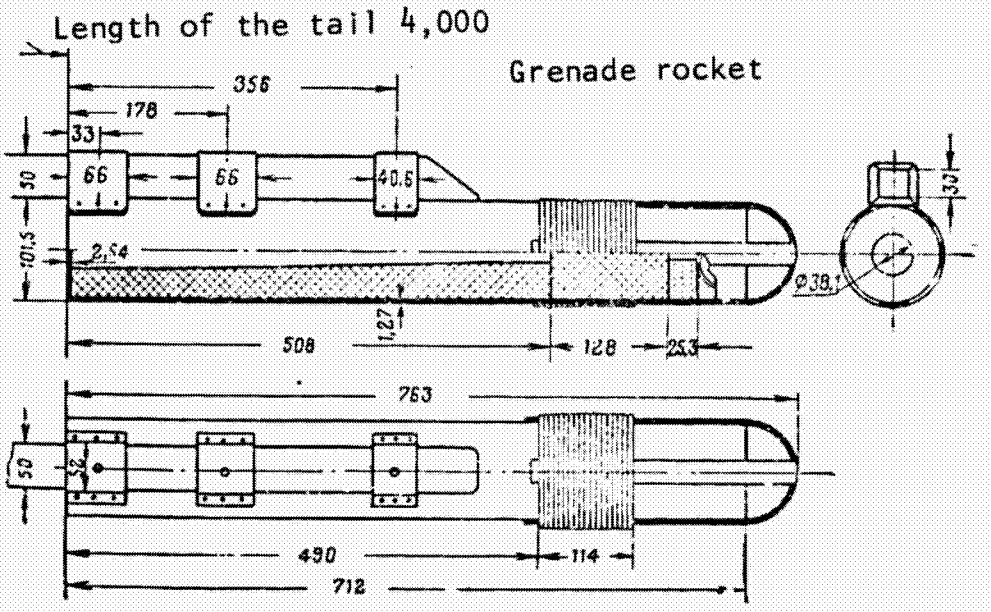
Studying the vast investigations of /357
Konstantinov in powder rockets, we can affirm that in the middle of the 19th Century he was the conceptual guide of a school of rocketmen who established the leading methods or producing military powder rockets in Russia and worked out the foundations of experimental rocket dynamics. For these reasons, Russian military powder rockets were the best in the world in those years.

This period of rocket technology development in Russia was closely /358
connected with the direct requirements of the army and the development and creation of types of weapons. From a scientific point of view, it was a period of accumulation of technical experience, a period of scientific observation and qualitative systematization of experimental material.

Russia stood at the head of progress in rocket technology because a substantial element in improving combat rockets was the introduction of scientifically established experiments, which made it possible to analyze the influence of design parameters on the ballistic characteristics of rocket rounds. However, the great productive and experimental material collected in the Petersburg Rocket Establishment did not receive wide scientific generalization, and a strict theory of rocket flight (a theory of ballistic design) could not be established in those years. This was correctly appreciated by Konstantinov himself. In his work, *On combat rockets*, he wrote, "These facts are only the results of observation, but they point to the possibility of a mathematical theory for the design and firing of rockets. In a word, the possibility of rocket ballistics. But this is a science which still needs to be founded" [365].

Konstantinov's work on powder rockets substantially improved this type of armament. However, the achievements of rifled artillery were even more significant and interest in military powder rockets began to weaken. At the end of the 19th Century, powder rockets were removed from the armament of units of the Russian Army.





Rockets of A. D. Zasyadko.

The inventive suggestions of the famous member of the Peoples' Will Party, Nikolay Ivanovich Kibal'chich, are extremely interesting for the history of the development of the idea of peaceful utilization of reactive flying apparatus. A short explanatory note on this invention was made by Kibal'chich in prison a few days before his execution.

N. I. Kibal'chich, the son of a country priest, was born on 19 October 1853 in the Chernigov government. In 1871, he entered the first course of the Petersburg Institute of Communications Engineers. Having finished two courses of this institute, in the summer of 1873 he became a student in the medical surgical academy. /359

For revolutionary activities, Kibal'chich was arrested on the 11th of October 1875 and spent two years seven months in various prisons. In 1879, Kibal'chich offered the Executive Committee of the Peoples' Organization,

"Land and Will" his services in the making of mines and bombs. He participated in the manufacture of mines for explosions in Odessa, prepared mines for explosions in the Winter Palace and finally, supplied bombs to the participants in the attempt on Tsar Aleksandr the Second. Captured on 17 March 1881, after the assassination of Aleksandr the Second, Kibal'chich in prison drew first on the wall, and then on paper brought to him, a plan for a reactive flying apparatus, and his last words before the court spoke of this plan.

K. I. Konstantinov

N. I. Kibal'chich

The clarifying note on the projected aerial device was connected with the "business on 1 March" and lay 37 years in the secret Archives of Police Headquarters. In 1918, Kibal'chich's plan was fully published.

In the explanatory note, Kibal'chich writes, "Being in prison, a few days before my death, I write this plan. I believe in the reality of my idea and this faith supports me in my terrible position. If after detailed consideration by scholars and specialists my idea is found useful, I will be fortunate to have given great service to the motherland and to humanity. I would then greet death quietly, knowing that my idea will not perish with me, but will exist among humanity for whom I am prepared to sacrifice my life...

"... Many inventors base the movement of aerial vessels on the muscular strength of a man... I believe that if it is possible to construct this type /360
of flying device, it would still have the characteristics of a toy and could not have any serious significance. What kind of force is required for aerial travel? The forces, in my opinion, found in slow burning explosive substances..."[366]

Further, Kibal'chich gives a detailed description of the flying apparatus

based on the utilization of a rocket engine. Schematically, Kibal'chich's reactive flying apparatus was a platform, to which powerful powder reaction motors were fastened on stands. By a special mechanism, powder grains were to be sequentially delivered to the chamber of the engine. The reactive forces developed in the burning of the powder grains with the chamber of the engine in a vertical position were to lift the platform upwards, in the concept of the inventor. By changing the orientation of the axis of an engine fastened to two stands in special pivots, relative to the platform, it would be possible to give the platform motion in a horizontal direction.

At the conclusion of his plan, Kibal'chich wrote, "The truth or falsehood of my idea can be finally decided only by experiment. Only from experiment is it possible to determine the necessary relationship between the dimensions of the cylinder, the thickness of the powder sticks and grains and the weight of the apparatus to be lifted. The first experiments can be conveniently carried out with small cylinders, even in a room" [367].

Kibal'chich requested that his plan be sent for consideration by a committee of competent scholars.

"I implore the scholars who will consider my project to take the most serious and conscientious attitude toward it and give me an answer as fast as possible", he wrote [368].

On 26 March 1881, the plan of Kibal'chich was sent to the police department and in the forwarding letter there was a dreadful and inhuman resolution, "Related to the business on 1 March. To hand it over to scholars for examination now would hardly be timely and could only cause superfluous rumors" [369].

Kibal'chich worriedly waited an answer without result, not guessing that there would be none. On 31 March 1881 he addressed the Minister of Internal Affairs with the following plea, "By your Excellency's disposition, my project for an aerial apparatus was transferred for review to a technical committee. Could your Excellency not make a disposition to permit me to have a meeting /361
with one of the members of the committee in connection with this project not later than tomorrow morning or at least to receive a written answer from the experts examining my project, also not later than tomorrow morning. I beg you, your Excellency, to permit me a meeting with all of my comrades in the legal process or at least with Zhelyabov and Perovskoy" [370].

There was no answer to this application either. The meeting was not permitted. On 3 April, at 7:00 in the morning in Peterburg, a notice was given out that "This morning 3 April at 9:00 in the morning the death penalty by hanging will be suffered by the state criminals: the lady Sof'ya Perovskaya, the son of the priest Nikolay Kibal'chich, the bourgeois Nikolay Rysakov, and the peasants Andrey Zhelyabov and Timofey Mikhaylov" [371].

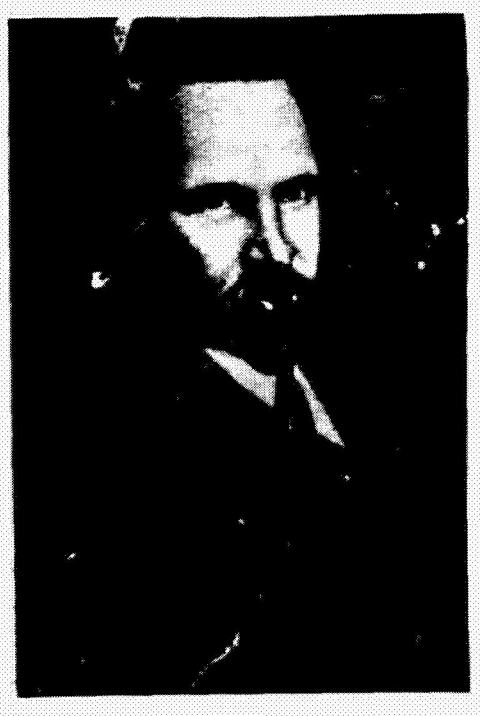
Kibal'chich was hung first. An officer who witnessed the execution later recalled Kibal'chich's unusual iron control. "On his face", he wrote, "it was impossible to read either terror, pride, contempt or a trace of any other feeling which could stir him at such a moment; it was the face of a scholar and

philosopher, solving some complex problem at this moment."

Considering his discovery extremely important for Russia, Kibal'chich evidently thought about his reactive flying apparatus until the last minute of his life.

The accumulated factual material on the preparation, testing and combat application of black powder rockets had to be generalized. To establish a theory of rocket flight, it was necessary to consider the existence of changes in the mass of the rocket during its movement with a working engine. Since the time of operation of the powder reaction engine was very small (one to three seconds), averaging methods ruled the minds of scientists and engineers, and the science of ballistic rocket planning was in an embryonic state. It was necessary to make a qualitative jump in the theoretical concepts. The sources of rocket flight theory became clearly visible at the end of the 19th Century in related sciences: hydromechanics and astronomy. Here it is necessary first to mention the work of the noted Russian mechanics Nikolay Yegorovich Zhukovskiy (1847-1921) and Ivan Vsevolodovich Meshcherskiy (1859-1935).

N. Ye. Zhukovskiy published three articles on the theory of reactive movement in water [372]. In these articles, published in 1882, 1886 and in 1908, the mechanism of formation of reactive forces in the movement of a body in an incompressible fluid was examined. The systems examined related to the case of movement in water or on the water, in which the mass of the moving body (ship or submarine) remains constant during the time of motion. The water is drawn in by a pump through a longitudinal channel in the body of the ship and thrown out behind the stern, with the mass of the water pumped in being equal to the mass of the water thrown out. Zhukovskiy obtained a formula to determine the reactive force acting on a ship immersed in a stream of liquid. This force was found to be equal to the product of the second mass of the input or output liquid times the difference in speeds at the input and output of the channels. /362



I. V. Meshcherskiy

Zhukovskiy investigated the origin of reactive forces for ships, considering the change in the frontal resistance of the ship from pumping in the liquid. In particular, he noted that if the water is taken in in the area of the stern of the ship, for some contours, the flow around the body of the ship can be improved and the vortex resistance can be reduced.

The first scholar to understand that the various cases of mechanical movement by a body with changing mass, observed in nature and in technology, belong to a new, more complete theory, was Ivan Vsevolodovich Meshcherskiy.

He is the founder of a new branch of theoretical mechanics, the dynamics of a point with varying mass. In our times, this branch has become the scientific foundation for the study of the stage movements of rockets.

The basic methods for the study of the dynamics of a point with changing mass in the case of particle separation were the content of a masters dissertation by Meshcherskiy [373]. The most important result obtained in this dissertation was the discovery of equations for the movement of a point with variable mass. It was found that the mathematical form of the equation for movement of a point with variable mass depends on the process of ejecting particles.

If the mass of the moving point is constant, Newton's second law is /363
obtained from Meshcherskiy's equation as a special case.

Based on the discovery of the laws of movement for objects with variable mass by I. V. Meshcherskiy, a great number of specific problems were investigated and, in particular, it was shown that vertical stages movement of a rocket can be reduced to a study of the movement of a point with changing mass.

Meshcherskiy's second fundamental work, published in 1904, was concerned with establishing the initial equation of movement for a point of variable mass for the case of simultaneous attachment and detachment of particles [374]. An example of this type is the movement of an aircraft with a gas turbine jet engine, when particles of air are taken from the atmosphere into the body of the aircraft and then ejected at high speed together with gaseous products from burning fuel. Meshcherskiy showed that a wide area of problems in mechanics connected with the study of moving bodies whose mass changed as a result of attachment and detachment of particles could be covered by a unified theory, the foundations of which are formulated with the same degree of accuracy as the laws of motion for bodies of constant mass.

It should be pointed out that the particular cases in the movement of a point with variable mass investigated by Meshcherskiy were primarily problems in astronomy and theoretical mechanics; the problem of rocket movement apparently interested Meshcherskiy less.

Konstantin Eduardovich Tsiolkovskiy (1857-1935) discovered the equation for straight line motion of a point of variable mass independently of Meshcherskiy's work and made systematic investigations of straight line rocket movement.

Tsiolkovskiy's first scientific work, in which he investigated reactive movement, goes back to 1883. He published a strict mathematical theory of rocket flight in the journal "Nauchnoe Obozrenie" in May of 1903. The talent of the noted scholar was more fully disclosed after the Great October Socialist Revolution. Basing himself on the aid of Soviet and Party organizations, Tsiolkovskiy founded an orderly system of mathematical theory for multi-stage rockets or rocket journeys in the last decades of his life.

In investigating the laws of rocket motion, Tsiolkovskiy sequentially studied the influence of the basic forces on rocket flight and provided the

first foundation for the possibility of using large rockets for interplanetary communications. First he determines what capabilities the reactive principle of generating mechanical movement has and sets a simple problem in straight-line rocket flight, assuming that the forces of gravity and air resistance are absent. This problem is now called Tsiolkovskiy's first problem. The movement of the rocket in this simplified case is based only on the process of ejecting (discharging) particles of substance from the chamber of a reaction motor. In his mathematical calculations, Tsiolkovskiy introduces an assumption of the constant relationship between the speed of particle ejection from the engine nozzle (K. E. Tsiolkovskiy's hypothesis). He compiles and studies in detail the equations of rocket motion for a constant speed of particle ejection, and obtains the extremely important formula for the speed of the rocket, known as Tsiolkovskiy's formula (or the basic equation of a rocket). /364

From Tsiolkovskiy's formula flow two important conclusions.

First, the speed of movement of a rocket at the end of the engine's operation (the end of the active portion of the flight) will be greater, the greater the relative speed of the ejected particles. If the relative speed of emission is doubled, the speed of the rocket is doubled.

Second, the speed of the rocket at the end of the active part of the flight is increased with an increase in the ratio of the initial weight of the rocket to the weight of the rocket at the end of burning. However, here the relationship is more complex. It is given in the following theorem of Tsiolkovskiy

"When the mass of the rocket plus the mass of the explosive substances in the reactive apparatus increased in geometric progression, the speed of the rocket increases in arithmetic progression" [375].

Further scientific technical analysis conducted by Tsiolkovskiy shows that the only practically applicable means for flights into outer space beyond the atmosphere is the rocket. A rocket has the following basic advantages in comparison with a gigantic cannon: it is cheaper; the acceleration of the rocket during the active part of the flight can be changed as desired, and therefore, it is possible to avoid excessively high acceleration (overloads); its velocity can be changed in any way and in any direction, in particular, it is possible to make a soft landing on a planet which does not have a dense atmosphere; in flights in the dense layers of the earth's atmosphere, the speed of the rocket can be made relatively low to insure relatively weak forces of resistance and low surface heating; in the rarified layers of the atmosphere, the speed can be increased without fear of burning from excessively high heating temperature. /365

Tsiolkovskiy wrote, "This work of mine has by far not considered all sides of the business and completely does not solve it from the practical side of relative feasibility; but perspectives are already visible through the fog in the far future, so fascinating and important that hardly anyone now dreams of them" [376].

Tsiolkovskiy's work on the theory of reactive motion were not limited to

calculations alone; practical instructions to the engineer designer are given in them for finding correct and original technical solutions. Tsiolkovskiy's rocket is represented as an elongated metal cigar, resembling a dirigible in form and dimensions. At the head of its first section there is a passenger area, equipped with control devices, light, carbon dioxide absorbers and oxygen stores. The main volume of the rocket is filled with flammable substances, which when mixed form an explosive mass, ignited in the combustion chamber of the reaction motor. The products of combustion, hot gases, pass through an expansion nozzle at enormous speeds.

Tsiolkovskiy considered that to change the direction of flight of the rocket in outer space, it was expedient to use gas controls or rotate the nozzle of the reactive motor combustion chamber. In contemporary rocket construction, both these ideas have found general recognition.

Tsiolkovskiy suggested that it would be reasonable to use the gyroscopic effect of rapidly rotating flywheels to stabilize the rocket's postion with respect to its center of gravity. We note that all contemporary automatic systems for the stabilization and control of rocket flight make wide use of the gyroscopic effect.

The great scholar foresaw the possibility of using liquid oxygen and liquid hydrogen as fuel components. He suggested that the walls of the chamber and the surface of the rocket (when it was moving in dense layers of atmosphere) be cooled with the fuel components. This idea of Tsiolkovskiy is used by rocket constructors in all nations of the world.

It is probable, wrote Tsiolkovskiy, that in the future the energy from the spontaneous breakdown of radium can be utilized in rocket technology. At /366
present we can now only admire the penetrating insight of Konstantin Eduardovich.

Tsiolkovskiy was able to publish the continuation of his work, "Investigations of areas of the world by reactive apparatus" only in 1911 and 1912 in the new Russian aviation journal, "Vestnik vozdukhoplavaniya".

In the second part of his work, Tsiolkovskiy investigated in detail the cosmic trajectories of rockets in the earth's field of gravity. He examined flights to the Moon, Mars and Venus in detail, and gave brilliant descriptions of physical phenomena under conditions of weightlessness.

Even in our days, these pages read like an absorbing story of real events experienced by travellers to other planets of the Solar system. Tsiolkovskiy carefully studied the means of supporting life during prolonged cosmic flights, considered measures of protection against excessively large overloads and dreamed of future rocket technology.

The outstanding discovery of Tsiolkovskiy is the strict mathematical theory of multi-stage rockets. He suggested two types of multi-stage rockets or rocket trains. The first type resembled a railroad train, only with the engine in the rear Imagine, for example, three rockets fastened together one

behind the other. Such a rocket train is moved first by the bottom (tail) rocket. After using the fuel of the tail rocket, it is separated from the train and falls to the ground. The engine of the second (middle) rocket begins to work, becoming the propulsive rocket for the train of the remaining two rockets. After the complete utilization of the fuel in the second rocket, it is also separated and the engine of the final (third) rocket begins to work. The third rocket can reach much higher speeds than a single rocket, since the two rockets dropped off in the process of starting have already given it some speed.

The second type of rocket train (or composite rocket) Tsiolkovskiy called a squadron rocket. Imagine that four single rockets fastened in parallel are launched. When each of the four rockets has expended half its fuel, two rockets (for example, one on the right and one on the left) transfer their unexpended fuel reserve to the half empty tanks of the remaining two rockets and are separated from the squadron. The two rockets continue to fly. Having expended half of its fuel, one of the squadron rockets transfers the remaining half to the last rocket, which is the one intended to reach the goal of the voyage.

If the force of air resistance is not considered, all the flight characteristics of rocket trains of the first and second types can be found by sequential/367 application of Tsiolkovskiy's formula.

Finding the optimum design for a rocket train is one of the most important and interesting scientific technological problems.

Tsiolkovskiy's works on the theory of rocket flight receive great attention from 20th Century rocket constructors and are widely famed in our nation. The characteristic mark of all Konstantin Eduardovich's work on rocket dynamics is a deep understanding of the tendencies in world technological progress, clarity and mathematical rigor of thought and classical exactness in formulas and conclusions.

First class scientific results, burning creativity, humanism and love for the motherland makes Tsiolkovskiy our companion, a fighter for the great future of the Soviet nation and a participant in the new projects of Russian cosmonauts. We are rightfully proud of our distinguished scholar, the originator of new directions in science and industry.

On 13 September 1935, a few days before his death, Tsiolkovskiy wrote that all his works on aviation, rocket travel and interplanetary communications he gave to the "Bolshevik Party and the Soviet Power, the real guide of human cultural progress." He was not wrong. The business to which Konstantin Eduardovich devoted all his life has triumphed.

The Development of Rocket Technology in the USSR

From the fundamental works on rocket dynamics and rocket technology, and also on the theory of interplanetary flights, which were produced in out nation in the 20's and beginning of the 30's and had substantial influence on the development of this branch of scientific technical progress, we note the work of Fridrikh Arturovich Tsander [377].

After finishing the Riga Polytechnical Institute in 1914, Tsander devoted all his further engineering and scientific activity to the practical (experimental) solution of the basic problems of rocket flight and the problems of interplanetary travel. In his autobiography, completed on 12 March 1927, Tsander notes that he has priority in the following questions:

"On equipping rockets with wings for flight in the atmosphere and achieving/368 cosmic speeds close to eight kilometers per second in its higher layers, and also for gliding descent from interplanetary space to the earth and other planets having atmospheres" [378].

F. A. Tsander (1887-1932)

The principal novelty of Tsander's suggestion that the elements of rocket construction or parts of an aircraft with rocket motor which were not needed for further flight should be burned up must be emphasized. If Tsiolkovskiy in the theory of multi-stage rockets considered the movement of a body with variable mass under conditions in which the mass changes suddenly at certain moments (the mass of the rocket is a step function of time), Tsander gives an example of movement with constant combustion of the body and parts of the rocketship, or speaking in contemporary language, he considers a rocket with a very good weight efficiency. In our days, it has been shown that by using the suggestions of Tsander, it is theoretically possible to obtain the rocket with the best flight characteristics.

A qualitative picture of the flight of an interplanetary vessel burning parts of its construction was given by Tsander in a report read on 20 January 1924 in the theoretical section of the Moscow Society of Amateur Astronomers. In the report he said, "...My interplanetary ship consists of an airplane to which a high yield aviation engine has been attached. The engine will work with liquid oxygen and gasoline and even ethylene or hydrogen, which ever proves most advantageous in experiments.

The engine will operate propellers and the airplane will leave the ground. With an increase in the altitude of flight, the speed will also increase. At an altitude of approximately 26 versts [a verst is equal to 1.067 kilometers -- Tr.] above the earth, the aviation engine will be turned off and a rocket motor with a thrust of 1,500 kilograms will be turned on. Then by a special mechanism we draw parts of the airplane into a boiler, where they will be melted down and /369 liquid aluminum will be obtained which, together with hydrogen and oxygen will serve as an excellent flammable material. The speed of flight of the apparatus, as a result of the increase in thrust of the rocket motor, will grow ever greater

and greater, and the altitude of the flight will increase simultaneously. At an altitude of approximately 85 kilometers above the earth, nothing will remain of the airplane, since it will have been completely melted down in the boiler and the melted metal will be used as fuel, and only a rocket with small wings and control surfaces and a cabin for people will remain" [379].

K. E. Tsiolkovskiy

An important and promising theoretical work by Tsander is his small book, "Problems of flight with reaction apparatus", published in Moscow in 1932. The first edition of the book was written in July of 1930. In the preface, Tsander states that "The book has the purpose of popularizing the idea of interplanetary communications." A particularly interesting section of this book is that with the title, "Flight of long-range rockets outside the atmosphere". In this section, starting from the laws of theoretical mechanics, Tsander gives an accurate and strict theory of elliptical projectories in the field of gravity of the earth, considering the force of gravity to be from the center. He was able to obtain fairly simple calculation formulas for all the basic elements of elliptical trajectories; particularly clear and accurate results were obtained for optimum elliptical trajectories. The tables for families of elliptical trajectories made by Tsander differ very little from contemporary tables (the differences are based on the accuracy of the initial data).

In 1961, two previously unknown works by Tsander were published, "Flights to other planets. (The theory of interplanetary voyages)" and "Calculations for flights by an interplanetary ship in the atmosphere of the earth (Landing)". These works were written by Tsander in 1924 and 1927. Particular care was taken in examining questions of determining the value and direction of additional velocities which must be imparted to an interplanetary ship travelling along with the earth in orbit as an artificial satellite, to reach the planet Mars. For the first time, the question of correcting the trajectory of the center of mass of a cosmic ship close to the planet which is the object of flight, was postulated and analyzed. Apparently, Tsander found the optimum elliptical trajectory for interplanetary flights independently of the work of the German scholar Homan, and it would be more just to call these trajectories Tsander-Homan trajectories. The tables (schedules) of flights from the earth to Mars calculated by Tsander have not lost their significance even in our time. /370

F. A. Tsander was also the organizer of the first group of engineers who devoted their labors to the development of rocket technology in our nation.

Yu. A. Gagarin and S. P. Korolev

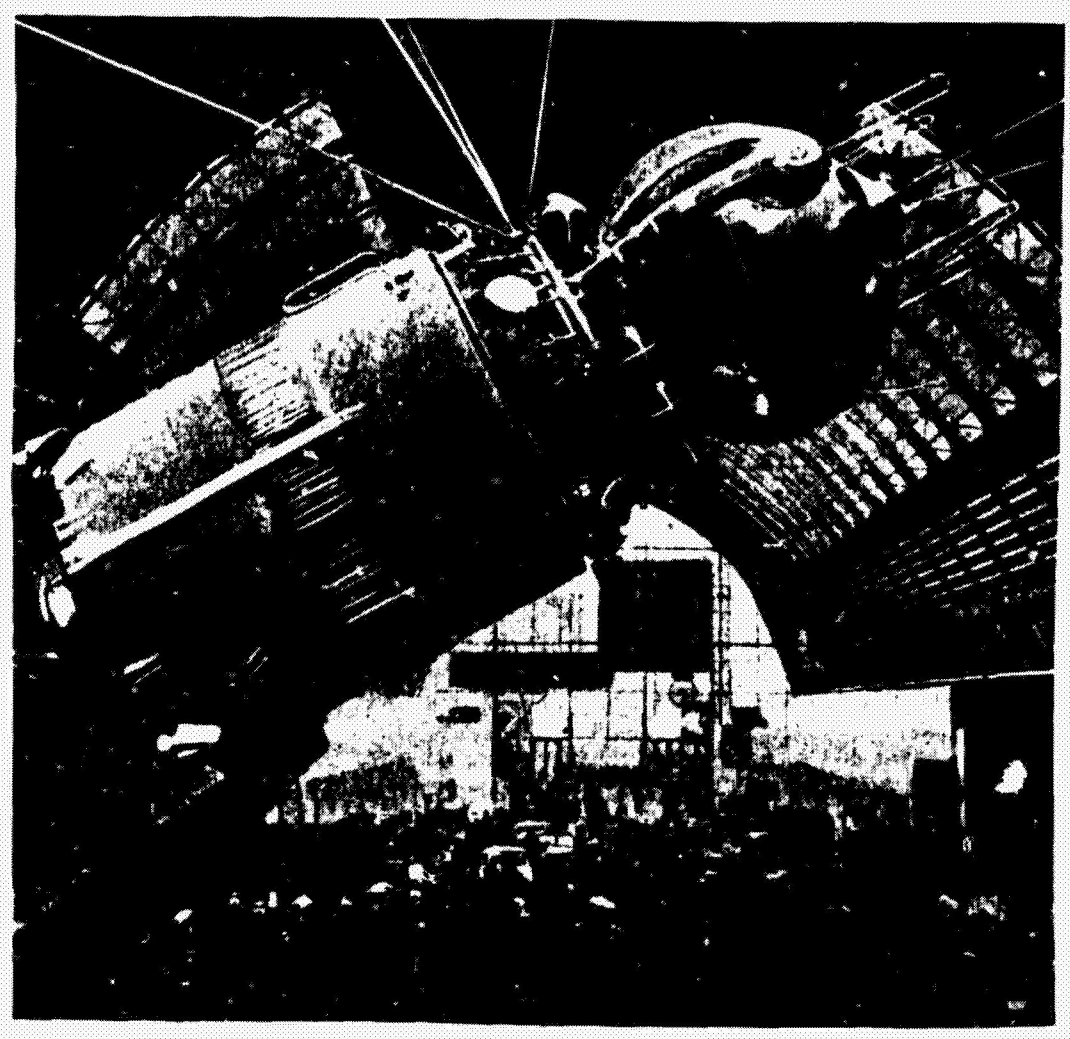
Work on building powder rockets with short flight ranges using the new smokeless pyroxylin powders, began in our nation soon after the completion of the Great October Socialist Revolution. The initiators of these works were the engineers V. A. Artem'yev and N. I. Tikhomirov, who in 1920, organized a workshop in Moscow for the manufacture of powder rockets. In 1924, V. A. Artem'yev proposed a new recipe for smokeless powder designated PTP (pyroxylin-trinittrotoluene powder).

The making of powder rockets was transferred to Leningrad. In March of 1928, successful launchings of rockets with PTP powder with flight ranges from 1.3 to 1.4 kilometers were made near Leningrad; these rockets were made in the reaction laboratory.

In June 1928, the reaction laboratory of the range was reorganized into the gas dynamic laboratory (GDL) of the Military Scientific Research Committee of the Revolutionary Military Council of the USSR. The founding workers of the GDL at its organization were V. A. Artem'yev, B. S. Petropavlovskiy, E. B. Shvarts, F. N. Poyda, V. I. Dudakov, I. I. Kulagin, G. E. Langemak and N. I. Tikhomirov.

In May 1929, an experimental design section for liquid reaction motors was organized within the GDL. In this section, recommendations were made for the oxidizers of liquid reaction motors: nitric acid, nitrogen tetroxide, hydrogen peroxide, tetranitromethane and others. In 1930 and 1931, liquid reaction motors were developed and made: the ORM-1 and ORM-2 (ORM -- experimental rocket motor). In the course of 1931, about 50 stand firing tests of

experimental rocket motors were conducted. In 1932, new experimental rocket motors were developed (from ORM-4 to ORM-22), in which various fuels, types of ignition, methods of starting the engine, systems of mixing fuels and oxidizers and other techniques were tested.



The First Cosmic Ship "Vostok" at the Exposition of Achievements of the National Economy of the USSR.

In 1933, the GDL built the ORM-50 (thrust 150 kilograms) and ORM-52 (thrust 300 kilograms) engines, for which the oxidizer was nitric acid, and the fuel was kerosene. The ORM-50 and ORM-52 engines passed official stand tests in 1933.

In November of 1931, at the Leningrad Society for the support of the defense and aviation-chemical construction of the USSR, a group was organized to study reactive movement (the LenGIRD). The founding workers of this group /371 were V. V. Razumov (the Chairman of LenGIRD and the Director of the Planning and Design Group), Ya. I. Perel'man (the Deputy Chairman and Director of the Group for Scientific Propaganda), N. A. Rynin, I. N. Samarin, A. N. Shtern and Ye. Ye. Chertovskoy (Deputy Chairmen of the Leningrad Society for the support

of the defense and aviation-chemical construction of the USSR (Osoaviakhim).[1]

On 12 August 1962 in the Soviet Union, the Cosmic Ship "Vostok-4", Piloted by Pilot-Cosmonaut Lieutenant Colonel P. R. Popovich, Was Put in Orbit Around the Earth.

In the photo: Muskavites and Visitors to the Capital in Red Square Greet the News about the New Flight of a Soviet Man in the Cosmos.

At the Moscow Osoaviakhim in 1931, a group was also founded to study reactive motion (MosGIRD). Leading roles in the organization of the group were played by F. A. Tsander, M. K. Tikhonravov, Ye. A. Pobedonostsev, L. S. Dushkin, S. P. Korolev, I. A. Merkulov, V. P. Vetchinkin, M. S. Kisenko and A. I. Polyarnyy.

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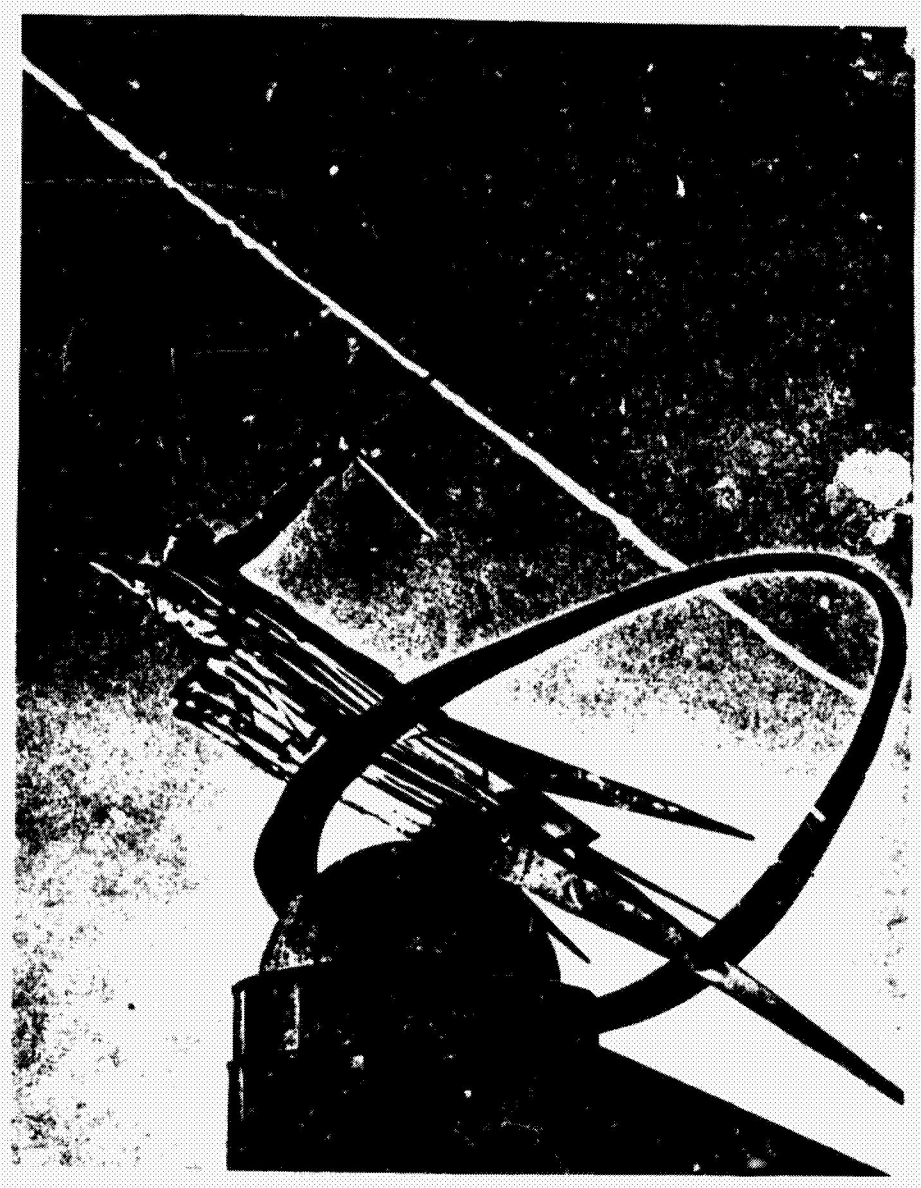
[1] The basic data on the works of GDL and LenGIRD is derived from the article by Professor G. Petrovich, "From the history of the Russian rocket", published in *Nedele* of the newspaper *Izvestiya*, No. 3, 10-16 January, 1965.



Into the Cosmos. A Sculpture by G. Postinkov

The first liquid reactive engine, the OR-2 designed by Tsander and built by MosGIRD, worked on oxygen and kerosene and had a thrust of 50 kilograms. It was tested in March of 1933. In the middle of 1933, the engineers of MosGIRD built model engines with thrusts of 50 to 70 kilograms. In August of 1933, they launched experimental rocket 09 with a liquid oxygen and congealed gasoline engine, which achieved a thrust of about 50 kilograms.

On 25 November 1933, a flight was made by the experimental rocket GIRD-Kh, with a liquid reaction engine operating on liquid oxygen and alcohol.

Thus, at the end of 1933, GDL, LenGIRD and MosGIRD had made the first models of powder and liquid rocket, and also reliably working liquid reaction engines using oxygen-alcohol and nitric acid-kerosene with thrusts up to 300 kilograms.

At the beginning of 1934, GDL and GIRD were united, and in Moscow, the reactive scientific research institute (RNII) was organized, in which all the basic investigations and developments of rocket technology were concentrated. I. T. Kleymenov was designated Chief of the institute.

The reactive scientific research institute developed an air-to-air powder reaction projectile (RS-82) for fighter aircraft. This projectile was accepted as armament in 1937. In July of 1938, a powder reactive projectile (RS-132) of the "air-to-air" type was accepted as armament for high speed bombers. The first combat application of air-to-air rockets occurred in the battles at the Khalkhin-Gol River in 1939. In 1941, powder reaction projectiles of the ground-to-ground type were built (M-8, M-13) with flight ranges from 6.5 to 8.5 kilometers. These rockets were mounted on self-propelled chassis. They began to be used in the Guards motor chast's of the Red Army from 15 July 1941. /372

In the years of the Second World War, ground-to-ground powder rockets were developed: M-20, M-31, M-13UK, M-31UK. These rockets were widely utilized in battle and were produced by the tens of thousands.

Parallel with the building of powder rockets, work went on on the design of rockets with liquid engines, which were first planned to be used in the interests of meteorology, for the investigation of the upper layers of the atmosphere.

The All-Union Conference on the study of the stratosphere, organized by the Academy of Sciences of the USSR and conducted in the beginning of April 1934 in Leningrad, had an extremely great significance for the development of liquid rockets in the USSR [380]. In the reports of Professor N. A. Rynin and engineer M. K. Tikhonravov, descriptions were given of two liquid fuel rockets.

The recording rocket of Razumov and Shtern (developed by LenGIRD) had a length of 2.565 meters, a diameter of 0.35 meters and a tail section width of 0.81 meters. The total launch weight of the rocket was 90 kilograms. The engine developed a thrust of 200 kilograms at a relative speed of ejection of 2,000 meters per second, and the maximum speed of the rocket reached 100 meters per second, with a calculated ascent altitude of 5 kilometers.

The rocket designed by Tikhonravov had a maximum speed of 376 meters per second and reached a maximum altitude of 9.7 kilometers. The greatest acceleration (according to overload) in a 20 second flight of this rocket was 35 meters per second^2. It was designed to preserve the useful load (meteorological instruments) with a parachute. The parachute was ejected by a special apparatus when the rocket reached its maximum altitude.

S. P. Korolev gave an interesting report on the flight of reactive apparatus in the stratosphere at this conference. In the middle of 1941, combat rockets of various classes and purposes using smokeless high caloric powder and meteorological rockets with liquid reactive engines were made in our nation. The rocket scientific research institute was organized

The successes achieved in the pre-war years by Soviet science and technology in the area of aviation and rocket construction were the basis on which the unprecedentedly rapid development of Soviet rocket technology and astronautics began after the war.

During the war years, 1941 to 1945, work continued in the Soviet Union on improving powder reactive projectiles. Tests were successfully conducted with /373
liquid rocket engines on gliders and specially designed aircraft.

After the victorious conclusion of the Second World War, with the transition to peaceful life, Soviet scientists and designers had a wider possibility of developing creative activity in the area of building new types of rocket technology. Parallel with the design of jet aircraft, they developed new rockets.

It is enough to point out, that in 1951-1953 in the Soviet Union, the planned launching of rockets to investigate the upper layers of the atmosphere at altitudes from 80-100 to 300-450 kilometers began. In 1951, the first rocket was launched with a sealed cabin on board, in which there were the experimental dogs Tsygan and Dezik. The cabin was equipped with specially developed systems for regenerating and conditioning the air, recording apparatus and means for safe landing and rescue. The animals reached a height of 100 kilometers and landed safely.

During the International Geophysical Year (1957/58) and the supplementary agreed period of International Geophysical Cooperation (1959) the launching of meteorological rockets was carried out by the scholars and engineers of the Soviet Union systematically at various points on the globe. The series production of MR-1 meteorological rockets was established.

In 1957-1959, 175 rocket launchings were made. In accordance with the program, these launchings were conducted: in the polar regions (on the Island of Kheisa and close to the Soviet south polar observatory of Mirnyy, from on board ship); in the central latitudes of the Soviet Union; in the northern waters of the Pacific Ocean (from on board ship); in the equatorial latitudes (from on board ship). 150 meteorological and 17 geophysical rockets were launched [381].

On 27 August 1957, the newspaper *Pravda* published a communication from TASS stating that a multi-stage intercontinental ballistic rocket had been launched in the Soviet Union. In the communication, it stated, "The test of the rocket went successfully, it fully confirmed the correctness of the calculations and the design chosen. The flight of the rocket reached an extremely high altitude, not reached before. Travelling an enormous distance in a short time, the rocket fell in the designated region. The results obtained show that it is possible to launch rockets to any region on earth".

From the fragmentary data given, it is possible to determine only very /374
approximately the extent of the gradious creative work performed in our nation in one decade (1948-1957). We must once again emphasize the thoroughness,

revolutionary dimensions and the care in carrying out the great work of setting up in the Soviet Union the research, design, manufacturing and test basis of rocket technology.

The successful tests of intercontinental ballistic missiles showed that there was a real technical capability for making flights in cosmic space and launching the first artificial earth satellites.

Great merit in the development of Soviet astronautics and rocket technology belongs to the tremendous designer of rocket-cosmic systems in the 20th Century, Academician Sergey Pavlovich Korolev, a member of the Presidium of the Academy of Sciences of the USSR, twice Hero of Socialist Labor and winner of the Lenin Prize.

S. P. Korolev was born on 30 December 1906 in the city of Zhitomir in the family of a teacher. In 1929, Sergey Pavlovich completed his studies of aero-mechanics. Drawn in glider and sport aviation, in 1930 he finished a pilots school. In 1929, he appears as one of the designers of the glider Koktebel'. In 1930, S. P. Korolev designed and constructed the glider Krasnaya zvezda, on which some figures of higher pilotage were performed for the first time in the world. In 1935, he took part in a glider gathering as pilot and designer of a two-place glider, SK-9. The outstanding characteristic of the gliders designed by Korolev is the increased load per square meter of wing surface. Apparently, Sergey Pavlovich thought even then of putting rocket motors on his gliders. In 1940, a liquid rocket engine was placed on the SK-9 glider. The first flight on the first rocket plane in the world designed by S. P. Korolev was made on 28 February 1940 by the pilot Vladimir Pavlovich Fedorov.

Sergey Pavlovich was one of the organizers of the group for the study of reactive movement (MosGIRD) in 1931. He did a great deal of fruitful work on various problems in reactive movement. In 1934, he gave a report, "The flight of reactive apparatus in the stratosphere" at the All-Union Conference for the Study of the Stratosphere in Leningrad [382]. At the conclusion of his report, S. P. Korolev stated, "Work on reactive flying apparatus is difficult, but unusually interesting and very promising. In the final analysis, the difficulties will doubtlessly be overcome, although perhaps with somewhat greater labor than at first appears". /375

Working in the reactive scientific research institute, S. P. Korolev directed his basic efforts to building winged controllable rockets with long flight ranges and rocket planes.

In March of 1935, at a session of the First All-Union Conference on the application of reactive flying apparatus to mastery of the stratosphere, Sergey Pavlovich gave a large report, "A winged rocket for human flight"[383] It is interesting to note, that Korolev pointed out the following design characteristics of a rocket plane: small wing span, small extension and a significantly long fuselage, the basic volume of which is occupied by fuel, the engine and the pilots sealed cabin. He also said, that here, "The basic place is occupied by a powerful rocket engine using liquid fuel Making human flight on rocket apparatus a reality is directly dependent on achievements in this area". In the

nclusion of the report, noting the great significance of winged rockets for uman flight in the stratosphere, he stated, "The task of the future is persistent daily work, without excessive tinsel and publicity, as has frequently been inherent, unfortunately, even up to now in many works in this area, to master the basics of rocket technology and occupy the first altitudes of the stratosphere and ionosphere".

In the post-war years, S. P. Korolev became a great designer of powerful multi-stage rockets. The rocket-cosmic systems developed under his direction were utilized for launching the first artificial satellites of the earth and the first automatic stations. He directed the building of piloted cosmic ships, in which the first flights of Soviet cosmonauts were made and the first exit of a man outside the confines of the ship directly into free cosmic space took place.

Sergey Pavlovich educated a numerous cadre of scientists and engineers, now working in scientific research and design organizations of our nation in the area of rocket technology and astronautics.

S. P. Korolev had outstanding gifts of scientific technical foresight and unusual strength of will, and was a calculating and far sighted organizer. Those around him were astonished by his inexhaustible energy, deep engineering intuition and daring in solving the most difficult scientific technical problems. He understood well the significance of what was achieved and did not /376 lose the overall perspective of scientific research. The designer clearly conceived a wide plan for mastering the cosmos and sequentially solved, together with a large collective of Soviet scientists, engineers and workers, all the most complex and important problems. Sergey Pavlovich was relentless with unfounded hairbrained schemes, groundless complacency in the area of new technology, with numerous "intelligent" pronouncements, and with those who were not inspired by a desire to create a new world of real things with their own hands and brains He was untiring in seeking solutions and moving specific affairs forward.

The President of the Academy of Sciences of the USSR, M. V. Keldysh said of him at a mourning assembly in Red Square in Moscow, "Academician Sergey Pavlovich Korolev belongs to the number of those noteworthy scientists of our nation who made an indelible contribution to the development of world science and culture" [384]. The first pilot-cosmonaut of the Soviet Union, Yu. A. Gagarin, correctly noted that, "The name of Sergey Pavlovich is connected with a whole epoch in the history of human civilization and technology".

S. P. Korolev died suddenly on 14 January 1966, in the 60th year of his life in the full bloom of creative vigor and talent. His remains are kept in the historical wall of the Kremlin in Moscow.

Artificial Earth Satellites and Flights to the Moon

Even in 1911, K. E. Tsiolkovskiy wrote, "The first great step of humanity is to leave the atmosphere and become a satellite of the earth" [385]. This great step in the history of civilization was made by the Soviet Union on 4

October 1957, when the first artificial earth satellite was put into near earth orbit. The satellite was in the form of a ball, 58 cm in diameter and weighing 83.6 kilograms. The antennas of radio transmitters were attached to the surface of the satellite. The radio apparatus and a source of power were placed in a sealed body, made of aluminum alloys. The external surface of the satellite body was polished to ensure the disposition of heat by radiation. Before launching, the satellite was filled with gaseous nitrogen, which was forceably circulated to ensure uniformity of temperature at all points within the satellite. The first satellite had two radio transmitters, working on frequencies of 20.005 and 40.002 megahertz (wavelengths of 15 and 7.5 meters respectively). The radio transmitters worked normally through the life of the satellite and made it possible to track the satellite by radio and determine the parameters of its orbit. Optical observations of the flight of the satellite were also organized. /377

The first Soviet artificial earth satellite was launched by a multi-stage rocket carrier into an elliptical orbit with a perigee of 228 kilometers and an apogee of 947 kilometers. The period of revolution of the satellite (the time of one trip around the earth) was 96.17 minutes; the angle of inclination of the satellite orbit to the plane of the earth's equator was 65°. The last stage of the rocket carrier, whose large dimensions made possible its observation at night with the naked eye, was also launched into the satellite orbit.

The satellite was mounted in the nose portion of the last stage of the rocket carrier and during the launching was protected by a special cone. In orbit, the satellite was separated from the rocket and began to move independently. Astronomical observers registered two new stars in their catalogs: the last stage of the rocket carrier and the first Soviet artificial earth satellite.

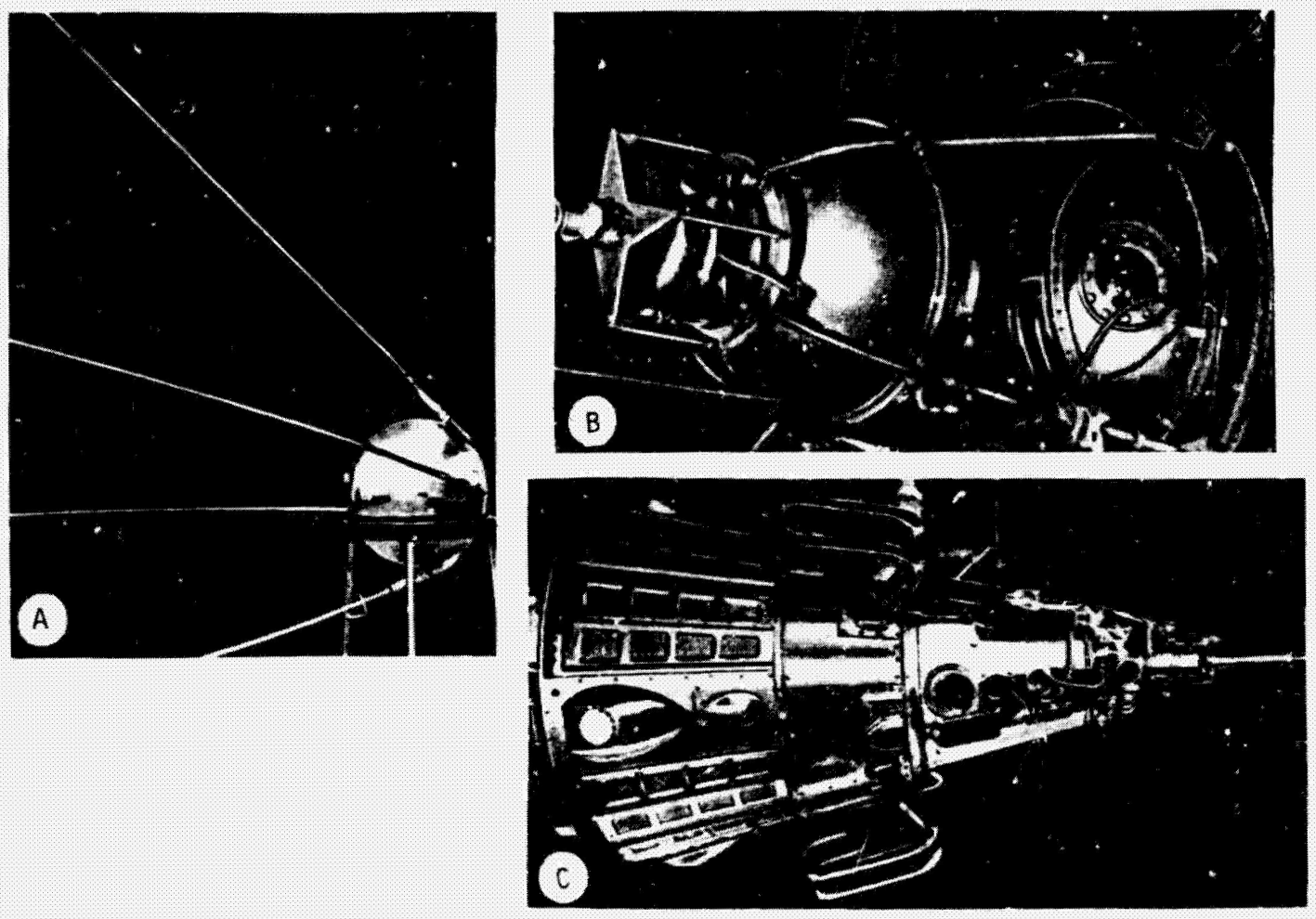
Although the satellite and the last stage of the rocket carrier revolved around the earth at high altitudes, in extremely rarified layers of atmosphere, the existence of forces of resistance nevertheless changed their orbits. The period of revolution of the satellite was reduced by 1.8 seconds per day. The first satellite made about 1,400 revolutions around the earth in 92 days. It existed until 4 January 1958. The rocket carrier was more energetically slowed by the atmosphere. It entered the denser layers of the atmosphere and was broken up by 1 December 1957.

One of the most valuable scientific results brought out in the process of flight by the satellite and the last stage of the rocket carrier was the determination of the density of the upper layers of the atmosphere. It was practically demonstrated that the entire satellite and rocket would burn up on entering the denser (lower) layers of the atmosphere.

The second artificial earth satellite was put in orbit on 3 November 1957. This satellite was the last stage of a rocket carrier, in which scientific apparatus and an experimental dog Layka were placed in separate containers. The total weight of the containers with the apparatus, animal and energy sources was 508.3 kilograms.

The basic apparatus placed in the second satellite made possible a wide program of scientific research. It was designed to investigate the radiation of the sun in the ultraviolet and x-ray regions of the spectrum, the radio transmission of signals from the satellite at wavelengths of 15 and 7.5 meters; the temperature regulation of the "atmosphere" in the containers and the maintenance of acceptable conditions for the existence of life (facilities for feeding, regenerating air, sanitary equipment and so forth). /379

/378



First Artificial Earth Satellite.

In addition, the body of the last stage contained radio telemetry apparatus, apparatus for measuring temperature, a program installation and source of energy. Information was sent to and from the satellite, and the satellite had stations connected into a special measuring complex. /379

The program of scientific investigations connected with the radio telemetry sessions, was calculated by the week. Optical observations were made of the satellite which made it possible to follow the evolutions of its orbit to the final revolution.

The second Soviet satellite was launched into an orbit with a perigee of 225 kilometers and an apogee of 1,671 kilometers. The period of revolution of the first turns was 103.75 minutes. The angle of inclination of the orbit

of the first turn to the equator was 65.3°. The second satellite made about 2,370 revolutions and ceased to exist on 14 April 1958.

The third Soviet artificial earth satellite was launched into orbit on 15 May 1958. Its weight was 1,327 kilograms and the weight of scientific apparatus and current supply reached 968 kilograms. The satellite was conical with a base diameter of 1.73 meters and a height of about 3.57 meters. During the active part of the flight, the satellite was covered by a protective cone consisting of two half covers and a point, which separated at the end of operation of the last stage engine. The third satellite was equipped with a great quantity of various scientific apparatus. The most important objects on the satellite were: radio telemetry apparatus, radio apparatus for measuring the coordinates of the satellite, apparatus of the system of thermal regulation for the "atmosphere" of the satellite, devices for measuring the intensity of primary cosmic radiation and registering the nuclei of heavy elements in cosmic rays, devices for registering the blows of micro-meteorites, devices for measuring the pressure and ion content of the atmosphere and the concentration of positive ions, and for measuring the strength of electrostatic and magnetic fields, and also the intensity of corpuscular solar radiation.

It should be pointed out that the multi-channel radio telemetry system was equipped with a memory device, which made it possible to "record" the data from scientific observations throughout the entire trajectory of the satellite and transmit it on command from the ground only during those portions which passed over the territory of the Soviet Union.

In the third satellite, there were electrochemical power sources (batteries) and semiconductor solar batteries. The solar batteries set a record for reliability and duration of operation.

The orbit of the third Soviet satellite had an altitude at perigee of 228 kilometers and an apogee of 1,881 kilometers; the period of revolution for the first turns was 105.95 minutes and decreased by 0.75 seconds per day. The satellite ceased to exist (entered the dense layers of the atmosphere) on the morning of 6 April 1959 on the 10,037 revolution, at a period of revolution of approximately 87 minutes. /380

The orbital parameters of the first three Soviet artificial earth satellites are given in Table 3.[1]

The rocket builders of the Soviet Union mastered the launching of artificial earth satellites, which were placed in near earth cosmic space with speeds close to the first cosmic speed. A system of flight control was worked out and tested, and the high accuracy of this system was demonstrated experimentally. The Communist Party gave the Soviet rocket builders a new mission: to master flights at speeds close to the second cosmic speed and explore cosmic space near the moon.

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[1] The table is taken from the book: S. G. Aleksandrov and R. Ye. Fedorov. "Soviet satellites and cosmic vessels", Moscow, Voenizdat Press, p. 203. 1961.

TABLE 3

Orbital parameters	1st satellite	2nd satellite	3rd satellite
Period of revolution around the earth (for the first turns)	96.17 min.	103.75 min.	105.95 min.
Height at perigee	228 km	225 km	226 km
Height at apogee	947 km	1671 km	1881 km
Inclination of the orbit to the earth's equator	65.1°	65.3°	65.2°
Daily reduction in the period of the first turns	1.8 $\frac{\text{sec}}{\text{day}}$	3.08 $\frac{\text{sec}}{\text{day}}$	0.75 $\frac{\text{sec}}{\text{day}}$

In the Soviet Union, intense work continues on the investigation of the cosmos with artificial earth satellites, cosmic scientific stations and rocket probes. It is sufficient to point out that on 1 July 1966, the 120th artificial earth satellite in the Kosmos series was launched in our nation. Launchings were made of the large research satellites Elektron and Proton, the communications satellites Molniya, the maneuvering satellites Polet and a number of special cosmic scientific stations launched towards the planets Venus and Mars.

Investigations of cosmic space have begun to yield the first practically /381
important results for our national economy. Thus, the Molniya satellites made it possible to establish reliable and high quality television transmissions between Moscow and the Far East (at ranges of 8 to 10,000 kilometers) without constructing expensive radio relay lines. Using the Molniya satellite, television transmissions have been made between Moscow and Paris.

To support the meteorological service of the USSR and investigate the upper layers of the atmosphere, more than 400 specially equipped meteorological rockets and rocket probes were launched in 1964 and 1965 alone.

Our nation is the initiator of international collaboration on the peaceful utilization of the cosmos and the planets of the solar system. On the initiative of the Soviet Union an agreement between the USSR and France was prepared and signed for collaboration in the study and mastery of cosmic space for peaceful purposes. Collaboration in the study of the cosmos is being succesfully set up with the nations of the socialist camp. The Soviet Union actively participates in the work of international organizations (the UN, the Committee for the Study of the Cosmos -- KOSPAR), emerging as the initiator of progressive international agreements. In June 1966, the USSR recommended through the United Nations a treaty plan, "On the principles of activity by states in the investigation of cosmic space, the Moon and other heavenly bodies".

In the course of 1959, three successful launchings of Soviet cosmic rockets toward the moon were made. Detachable cosmic devices were mounted on the last stages of the rockets and received the designation lunnik. The first

Soviet cosmic rocket was launched toward the moon on 2 January 1959. The last stage of the rocket together with the lunnik had a weight of 1,472 kilograms (after the expenditure of fuel). The speed of the last stage at the end of the active portion of the flight was somewhat above the local second cosmic speed, and therefore the trajectory of the first lunnik was close to a hyperbola. Under the influence of the force of earth's gravity, the speed of the lunnik decreased. At an altitude of 1,500 meters, the speed of the lunnik was a little more than 10 kilometers per second, but at an altitude of 10,000 kilometers it had been reduced to 3.5 kilometers per second. The duration of flight to the moon was 34 hours; the lunnik at the time of its closest approach was 5 to 6,000 kilometers from the surface of the moon. On 3 January at 3:57 Moscow time, a special device onboard the rocket released an artificial cloud of sodium. This cloud was observed by a number of astronomical laboratories in our nation, and accurate determination of its coordinates made it possible to precisely determine the trajectory of the lunnik.

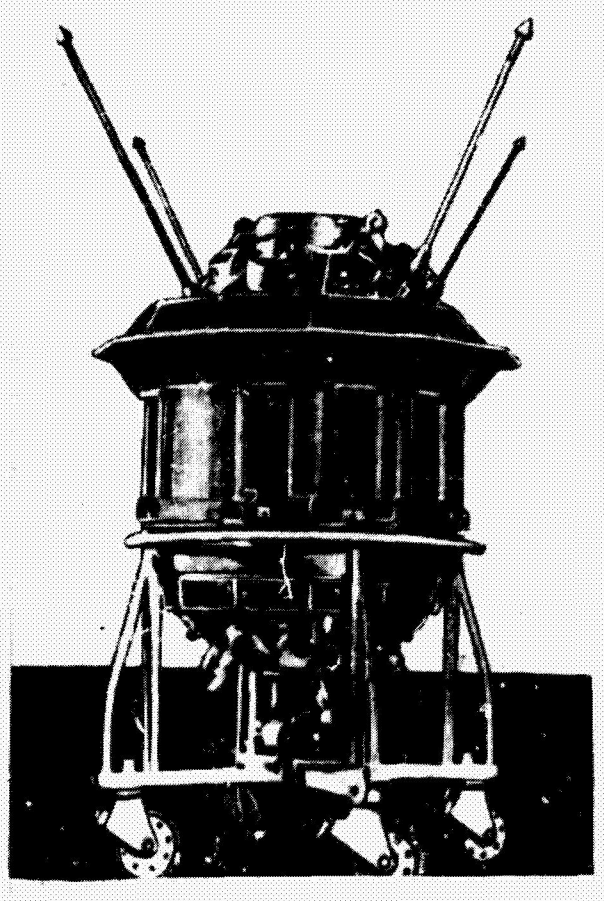
Basic scientific apparatus was mounted in the lunnik in the body of the last stage of the cosmic rocket. The apparatus complex included: a radio transmitter working at a frequency of 19.993 MHz; a telemetry assembly, designed to transmit data from the scientific measurements and data about the temperature and pressure within the container of the lunnik; a radio transmitter working at a frequency of 183.6 MHz (this transmitter was used to check the movement in the orbit and the transmission of scientific information); a device for measuring the intensity of cosmic rays; an apparatus for studying the gas components of interplanetary substances and the corpuscular radiation of the sun; an apparatus for studying the magnetic field of the earth and the moon; a device for registering heavy nuclei in primary cosmic radiation and the intensity of variations in cosmic rays; devices which registered collisions with meteors. The total weight of the scientific instruments and power sources and the individual cosmic apparatus was 361.3 kilograms. The apparatus worked normally, and the program of scientific observations was carried out. /382

When the lunnik passed within the field of gravity of the moon, its trajectory was deflected towards the moon, but its speed was somewhat increased. At a distance of one million kilometers from the center of the earth, the lunnik passed out of the sphere of influence of the earth's gravitational field, and its further movement was determined by the gravitational field of the sun. Approximately 7-8 January 1959, the Soviet cosmic rocket became a satellite of the sun -- the first artificial planet of the solar system. Soviet scientists calculated the orbit of this planet. The inclination of the orbit of the artificial planet to the plane of the ecliptic (to the plane of the trajectory of the center of gravity of the earth) was 1°. The eccentricity of the orbit was 0.148. The time of revolution of the artificial planet around the sun was 450 days. In this orbit, the minimum distance from the center of the sun (perihelion) is 146.4 million kilometers, and the maximum distance from the center of the sun (aphelion) is 197.2 million kilometers.

The launching of the second cosmic rocket to the moon (the second lunnik) was made on 12 September 1959. The final stage of the rocket (without fuel) together with the lunnik weighed 1,511 kilograms. The design of the second lunnik was close to the design of the first. The purpose of the launching was

the investigation of cosmic space in the region of the earth and the moon and a landing on the moon (a touchdown). The separation of the second lunnik from the last stage of the rocket carrier took place at the end of the active portion of the flight, when the engine of the final stage was switched off. The trajectory of flight of the second cosmic rocket was close to a hyperbola. It was so selected, so that at the moment of landing the moon would be almost directly overhead and conditions would be best for observation. This also ensured optimum conditions for radio communication. The lunnik reached the surface of /383
the moon after one and a half days.

The complex of basic scientific apparatus consisted of devices designed for investigating the magnetic fields of the earth and the moon, the radiation belts around the earth, cosmic radiation, the gas components of interplanetary matter and the distribution of meteoric particles. The cosmic rocket had transmitters working at frequencies of 19.993, 19.997, 20.003, 39.986 and 183.6 MHz, and also contained an apparatus for creating an artificial sodium comet. It also contained streamers with the state emblem of the Soviet Union and the notation, "USSR, September 1959". The preservation of the banner in landing on the moon was ensured by specially designed apparatus. Measures were /384 also taken to prevent the contamination of the lunar surface by earth's microorganisms. The total weight of the scientific and measuring apparatus together with the power sources and lunnik was 390.2 kilograms.



Automatic Interplanetary Station "Luna-3", an Automatic Apparatus Which Has Been Sent to Our Neighbor, the Moon.

On 13 September at 16:40 hours the second cosmic rocket reached the sphere of influence of the moon. The landing took place at 0 hours 02 minutes 24 seconds, 14 September 1959 by Moscow time. At the moment of landing, the speed vector of the rocket was approximately 3.3 kilometers per second at an angle of 60° to the surface of the moon. The second lunnik landed on the surface of the moon west of the Sea of Serenity close to the lunar craters Archimedis, Aristides and Avtolik. The inclination of the point of landing from the center of the moon was about 800 kilometers. The last stage of the rocket carrier also reached the surface of the moon. This flight showed the high accuracy of the rocket carrier control system; many scientists and engineers aboard had long considered that it was impossible to strike the moon without correcting the flight trajectory. The second Soviet cosmic rocket opened the era of interplanetary flights.

On 4 October 1959, the third Soviet cosmic rocket (third lunnik) was launched.

The basic purpose of the investigation in the flight of the third lunnik was photography of the side of the moon not visible from the earth. As is well known, the period of rotation of the moon about its own axis is equal to its period of revolution around the earth, and therefore the moon always presents the same face to the earth;only with cosmic vessels is it possible to see the side of the moon which is unseen from the earth. To solve the problem of photographing the "back" side of the moon, develop the photographs obtained onboard and transmit them by television to ground observation points, an automatic interplanetary station was built. The basic systems on board the station which made it possible to carry out this unique experiment were the following: the radio-technical system which measured the orbital parameters of the third lunnik, transmitted television and telemetry information to the ground stations and receive commands from the earth to control the operation of the station; a phototelevision system, intended to photograph the moon with subsequent automatic development of the film on board the interplanetary station and transmission of the pictures obtained by a television channel to the ground; a special orientation system, which supplied the necessary orientation of the interplanetary station with respect to the sun and the moon, suitable for photographing the unseen side of the moon, and systems for thermal regulation and energy production.

The last stage of the rocket carrier of the third lunnik weighed 1,553 /385
kilograms (without fuel). The weight of the automatic interplanetary station was 278.5 kilograms. In addition, the compartments of the last stage of the rocket carrier contained a measuring apparatus with a power source weighing 156.5 kilograms. Thus, the useful load of the third lunnik was 435 kilograms.

The automatic interplanetary station was in the form of a cylinder with spherical insurfaces. The maximum diameter of the station was 1,200 millimeters, the height was 1,300 millimeters (without antennas). The aluminator for the photographic apparatus was placed on the upper cover.

To take photography, the entire station was pointed at the object of photography by the orientation system. This system stabilized the station on receipt of commands from the earth, orienting it with the aid of solar sensors so that the axis of the photographic apparatus was pointed at the moon. The transmission of the signal "presence" of the moon from the optical apparatus to the earth permitted photography to take place. The photographic apparatus was equipped with two objectives, with focal lengths of 200 and 500 millimeters. The objective with a focal length of 200 millimeters gave a full picture of the disk of the moon; the objective with the focal length of 500 millimeters gave large scale representation of a part of the moon disk. The entire process of photography and developing the film took place automatically as called for in the program. The transmission of pictures of the moon to ground stations took place on command from the earth. The onboard apparatus of the third automatic station had many original automatic installations, which provided orientation, stabilization, the conduct of photography, development, drying and television transmission of the pictures obtained.

The flight trajectory of the lunnik was chosen so that at the moment of maximum approach it was south of the moon. Due to the attraction of the moon, the flight trajectory was deflected to the north, which provided a position for the lunnik more convenient for observation from the earth.

On its return to the earth, the third automatic station passed at a distance of 47.5 thousand kilometers from the center of the earth. The greatest distance from the center of the earth (apogee) was 480,000 kilometers. Soviet scientists had demonstrated that the influence of the sun's gravitational field causes a reduction in the height of perigee of orbits. Processing the experimental data on trajectory measurements made it possible to establish a design path so that the third lunnik made about 11 revolutions around the earth.

The most important stages in the investigation of the moon and the near lunar cosmic space are: soft landing a station on the surface of the moon and making an artificial satellite of the moon. These stages were first carried out by creative Soviet cosmonauts. Much labor and talent was contributed to /386
the successful performance of these flights by the rocket carrier designer S. P. Korolev (1906-1966).

According to the program of flight, the Soviet automatic station "Luna-9" made a soft (without shock) landing on the surface of the moon on 3 February 1966 at 21 hours 45 minutes 30 seconds Moscow time. The first human cosmic apparatus in the history of human civilization landed on the moon to transmit scientific information from the surface of the moon.

The moon has no atmosphere, and making a shockless landing on its surface is one of the most difficult problems of astronautics. Orientation and steady reduction in the speed of the lunnik must be provided by special rocket engines, which require a significant reserve of fuel. The soft landing of the Luna-9 station was preceded by the launching of lunar stations which made it possible to work out under natural conditions a system of trajectory radio control, on-board radio apparatus, an astro-orientation system and instruments for automatic guidance.

The weight of the Luna-9 station after launching on its trajectory of flight to the moon was 1,583 kilograms. The characteristic parts of the flight trajectory are the following:

- in the first active portion of the flight, a rocket carrier launched the automatic station Luna-9, with a rocket assembly intended for subsequent acceleration to the second cosmic speed, into earth orbit;

- the second portion of the flight was the firing of the acceleration rocket assembly and Luna-9 left on a flight trajectory to the moon;

- in the third portion the trajectory was corrected, which made it possible for the Luna-9 station to encounter the surface of the moon in the previously chosen level area (the so-called Ocean of Storms);

- on the fourth portion there was a steady breaking and a soft (shockless) landing.

At the moment of reaching the surface of the moon, the automatic lunar station with a shock absorbing system was separated from the breaking engine installation. Four minutes and 10 seconds after landing on the moon the station opened its antenna and began the first radio transmission session from the surface of the moon. At 4:50 on 4 February the station Luna-9 began to survey the lunar landscape and transmit its pictures to the earth.

The published photographs of the lunar surface have appeared in the press of the entire world and are well known. From these photographs it became clear that the surface of the moon consists of fairly firm powder-like pumice or slag. A hypothesis which circulated widely abroad that the lunar surface was /387
covered with a thick layer of ashes (or dust), was reputed. After the photo-transmissions of the Luna-9 station, the whole world understood that a man could reach the surface of the moon and walk on it.

Two months later, 3 April at 21 hours and 44 minutes Moscow time, the new Soviet automatic station Luna-10 went into orbit as an artificial satellite of the moon. The building of an artificial moon satellite is a necessary stage in the conquest of the moon by man. It made it possible to clarify the following important questions:

- investigate near-lunar cosmic space;

- clarify the meteor situations;

- determine the heat characteristics of the lunar surface;

- accurately determine the magnetic field of the moon;

- accurately determine the gravitational field of the moon;

- determine the constant change (evolution) in the orbit of an artificial moon satellite.

The orbital parameters of the Luna-10 station were at first the following:

- distance at aposelene (maximum distance from the surface of the moon) about 1,000 kilometers;

- distance at periselene (minimum distance from the surface of the moon) about 350 kilometers;

- period of revolution about three hours.

The results of scientific observations have not yet been published.

Flights of Cosmic Vessels

The five flights of Soviet cosmic vessel satellites made in the period from 15 May 1960 to 25 March 1961 have very great significance in the preparation of manned flights in near-earth cosmic space. These launchings were a part of a wide program by the Soviet Union for the practical mastery of cosmic space.

The first Soviet satellite ship was launched into an elliptical orbit on 15 May 1960. The initial height of perigee of the orbit was 312 kilometers, and the height of apogee was 369 kilometers. The initial period of revolution was 91.2 minutes; the inclination of the orbit to the equator was 65°. The total weight of the satellite ship after separation from the last stage of the rocket carrier was 4,540 kilograms. The multi-stage rocket carrier was more powerful, and this was the first time that such a large payload had been put into satellite orbit. In the satellite ship th e was a field cabin weighing 2,500 kilograms, a prototype of the planned cabin or pilot cosmonauts. The weight of the /388
apparatus mounted on the satellite ship was 1,477 kilograms. In the flight of this ship, a thorough test was made of the orientation system which provided a determined position of the ship in orbital flight. Simultaneously, the operation of the thermal regulation and "atmosphere" conditioning system in the field cabin was studied. A special breaking engine installation designed to reduce the speed of movement of the ship at a chosen moment of time and transfer the satellite ship to a landing trajectory was utilized for the first time. The radio-technical and radio-electronic apparatus was designed to measure the orbit of the ship, control the operation of its onboard systems, transmit telemetry information to the earth and provide communication between the ground stations and the ship.

The program of scientific observations was carried out until 19 May 1960. Experimental data were received about the active part of the flight with the powerful rocket carrier, which launched the cosmic ship satellite into the intended orbit with high accuracy; the reliability of operation of all systems which provided normal conditions for life in the field cabin, was checked. The ship satellite obeyed the control commands well, and the ground stations received the necessary telemetry information about the parameters of the ships movement.

On 19 August 1960, the second cosmic ship-earth satellite was launched. This ship satellite was put into a near circular orbit. The smallest distance of the ship from the surface of the earth (perigee) was 306 kilometers, and the greatest (apogee) was 339 kilometers. The initial period of revolution of the ship was 90.7 minutes, the inclination of the orbit to the plane of the equator of the earth was 64° and 57 minutes.

The basic mission for which the second Soviet ship satellite was launched was the conduct of investigations in the development of systems to support the normal life activity of a man in the sealed cabin, and also a study of questions of safety in his flight and return to earth. The scientific program of flight included medical-biological questions, and it was decided to put two dogs on the cosmic voyage, Belka and Strelka. In addition, a special compartment contained 12 mice, insects, plants, fungus cultures, seeds of wheat,

peas, corn, onions, several types of microbes and other biological objects.

The second cosmic ship satellite consisted of two parts: the sealed cabin of the ship and the instrument section. In the cabin, there were: apparatus for ensuring the life activity of living creatures in flight; apparatus for registering the parameters of cabin movement during the launch phase (sensors /389
for acceleration, angular velocity, temperature and others); a catapulted container with a parachute system, in which the biological objects and living substances were located; part of the apparatus for scientific investigations; equipment for biological experiments; part of the apparatus of the orientation system; systems for landing the cabin of the ship and for other purposes.

The instrument section contained radio telemetry apparatus for controlling the flight of the ship, thermal regulation apparatus, the breaking engine installation and others. The energy supply was provided by a chemical source of current and solar batteries. The solar batteries used a special orientation system so that they always remained turned to the sun, regardless of the orientation of the ship.

One of the most important problems solved in the second cosmic ship satellite was the problem of safely landing the ship in the assigned region. To provide an accurate, safe landing, it was necessary to reduce the speed of the ship by a given value at a strictly determined moment, with the help of the breaking engine installation and bring the ship into denser layers of the atmosphere at a fairly small angle of tangency (to prevent great overloads and strong heating of the surfaces), eject the catapulted container with the living organisms and use the parachute system to land the "capsule" of the ship satellite.

The solution of all the complex problems mentioned was made successfully. The ship satellite made 18 revolutions around the earth and landed less than 10 kilometers from the calculated point. The speed of landing of the container was 6 to 8 meters per second, and the cabin of the ship, 10 meters per second. The maximum overload on the descent trajectory did not exceed 10 gravities. These results must be considered extremely good, since an error in the speed after the breaking engine installation stops of one meter per second gives a deflection in the landing point of 50 kilometers, an error in the determination of altitude (at the moment of starting breaking) of 100 meters deflects the landing point 4.5 kilometers and an error in the angle of tangency of one minute leads to a deflection of the point of landing by 50 to 60 kilometers.

The presence in the cabin of living matter required the solution of a whole set of technical biological problems: strict thermal regulation of the air temperature, the organization of food and water supply for the living creatures, the removal of carbon dioxide gas, strict control of the oxygen supply, the development of sanitary installations and others. To obtain objective data about the experimental animals on the second cosmic ship satellite, a television system was installed which transmitted accurate pictures of the animals on command from the earth (there were two television on board the/390
ship). These first television transmissions from the cosmos gave the necessary experimental material for contemporary Soviet cosmic television.

Although the launching of the first two ship satellites gave encouraging data for the organization of human flights in near-satellite orbits, in accordance with the program, three more experimental ship satellite flights were made.

Basic data about these three flights is given in Table 4.

TABLE 4

Number of the ship satellite and date of launching	Orbit					Supplementary data
	Weight of the ship satellite, kg	Height of perigee, km	Height of apogee, km	Period of revolution, minutes	Inclination of the orbital plane to the equator	
Third cosmic ship satellite 1 Dec 1960	4563	187.3	265	88.6	64°58'	The flight lasted 12 hours. On 2 December 1960 the ship came down on an unplanned trajectory and ceased to exist in the dense layers of the atmosphere.
Fourth cosmic ship satellite 9 March 1961	4700	183.5	248.8	88.6	64°58'	The cabin was set up with an experimental animal (the dog Chernusha). A dummy was put in the pilot cosmonauts seat. After carrying out the program of investigations and observations, the ship was landed in the designated area on the same day (9 March 1961).
Fifth cosmic ship satellite 25 March 1961	4695	178.1	247	88.42	64°54'	The cabin was set up /391 with the dog Zvezdochka. There was a dummy in the pilot cosmonaut seat. After carrying out the program of investigations and

Table 4 (continued)

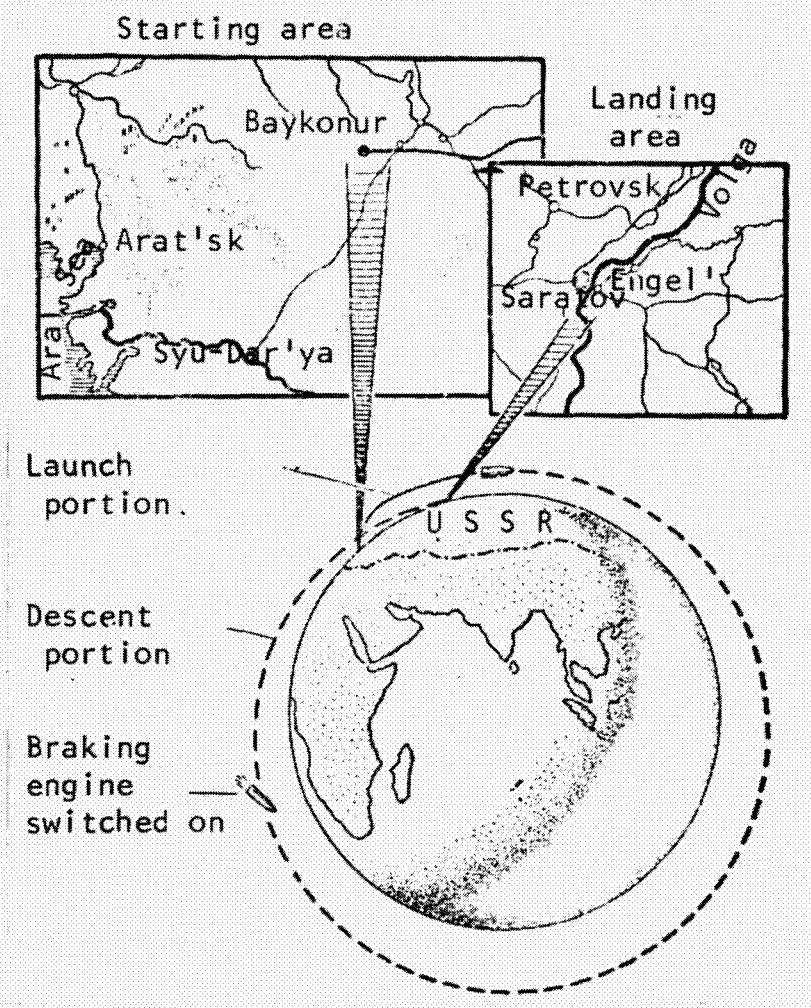
Number of the ship satellite and date of launching	Orbit: Weight of the ship satellite, kg	Orbit: Height of perigee, km	Orbit: Height of apogee, km	Orbit: Period of revolution, minutes	Orbit: Inclination of the orbital plane to the equator	Supplementary data
						observations, the ship was landed in the assigned region on the same day (25 March 1961).

The last two launchings (fourth and fifth ship satellites) demonstrated the faultless operation of all systems, the moderate overloading on landing trajectories, the absolute reliability of the heat protective system and the good reproducibility of the flight results as far as orbital parameters were concerned. The Soviet Union approached close to making flights by pilot cosmonauts in near-earth orbits.

The accumulated experience and scientific technical material obtained in launching Soviet artificial earth satellites and ship satellites made it possible for the Soviet Union to be the first in the history of civilization to prepare and carry out a successful manned flight in cosmic space. This flight signifies one of the most important achievements of human thought in the 20th Century. On 12 April 1961, the Soviet cosmic ship Vostok with pilot-cosmonaut of the USSR Major Yuriye Alekseyevich Gagarin on board was launches into earth satellite orbit. The selected flight path was close to the already tested paths of the fourth and fifth cosmic ship satellites. The weight of the piloted ship satellite Vostok without the last stage of the rocket carrier was 4,725 kilograms. The height of perigee of the orbit was 181 kilometers, the height of apogee 327 kilometers, the period of revolution was 89.1 minutes and the angle of inclination between the plane of the orbit and the plane of the equator was 64° and 57 minutes.

The rocket started on 12 April 1961 at 9:07 Moscow time from the Baykonur Cosmodrome. The ship Vostok made one orbit (one turn) around the earth and landed safely close to the village of Smelovka, in the Ternovsk region, Saratov area. /392

The first cosmic flight of a Soviet pilot opened the era of direct penetration by humanity in cosmic space, it was one of the most important events in the history of human culture. The execution of this flight was the result of carrying out a great and purposeful program of work in mastering cosmic space, led by the Soviet Union.



Start and Landing Areas of the First Cosmic Cosmic Ship.

The great dream of the founder of cosmic flights, K. E. Tsiolkovskiy, had begun to come true, "Mankind will not remain forever on the earth, but in the pursuit of light and space, will first timidly penetrate beyond /393 the limits of the atmosphere and then win for itself all the space around the sun" [386].

In building the satellite ship Vostok, questions of pilot cosmonaut safety were the most important. The seal of the cabin, the protective spacesuit, the design of the ejection seat, the selection of a ship trajectory -- all these were provided to yield reliable, safe and comfortable flight conditions. The satellite ship Vostok had two basic parts: the pilot's cabin with systems for supporting normal living conditions and the landing system; the instrument section with apparatus used in flight along the trajectory and the braking engine installation.

Of the numerous systems in the equipment of the piloted satellite ship, the following should be mentioned: apparatus for controlling the flight and a system of manual control for the ship (a pilot panel, instrument board, manual control assembly and others); a landing system; a radio apparatus for communications between the cosmonaut and the ground stations; a television system for observing the cosmonaut from the ground; an orientation system apparatus; a temperature regulation system apparatus; a parachute system mounted in the ejection seat of the pilot, a pyrotechnical installation, a spacesuit ventilation system and parachute oxygen apparatus; a carried emergency ration (food, water, ammunition, a means of radio communication and direction finding). The design of the satellite ship made it possible either to land the pilot in the cabin of the ship or to land while ejecting the pilot.

The most difficult part of the flight is the descent from orbit to the earth. It is about 8,000 kilometers long and takes about 30 minutes of flight time. The program for this section of the flight calls for the solar orientation system of the ship to be switched on and then for the rocket engine of the

braking installation to be turned on with the necessary accuracy and a flight on a descending trajectory.

Particular attention was paid to the thermal insulation of the pilot cabin cover. The heat protection layer reliably protected the walls of the cabin from burning in the dense layers of the atmosphere. There were three windows in the casing of the cabin with fireproof glass and two rapid opening hatches.

To orient the cabin with the manual control, the pilot cosmonaut had to use an optical orientation device installed in one of the cabin windows. With correct orientation of the cabin with respect to local vertical, the pilot would see in his field of view a representation of the horizon in the form of a ring. On the instrument panel there was an indicator in the form of a globe which made /394 it possible to determine quickly the current location of the ship and the point of landing in case the braking engine installation should be switched on at any given moment of time.

It should be noted that in case of failure of the braking engine installation, the selected elliptical orbit and the height of its perigee guaranteed a relatively quick descent by the ship to the ground from aerodynamic braking forces, particularly noticeable in the region of perigee. The reserves of food and water, the system for supporting normal life activities and the source of electrical energy were designed for flight duration of 10 days.

Special scientific institutions set up by the USSR conducted detailed investigations on questions of medical support for human flights in cosmic space.

Special pilot cosmonaut training was set up. This training included flights on aircraft in parabolic trajectories. This simulates the condition of weightlessness. Training was carried out using a mock-up of the cosmic ship cabin and on a special trainer. The cosmonauts endured prolonged isolation in a specially equipped sound isolation chamber. They learned to endure great overloads in a centrifuge (at fairly high overloads) and made parachute jumps from aircraft. The cosmonauts went through a special complex of physical training (gymnastics, games, jumps into water and others).

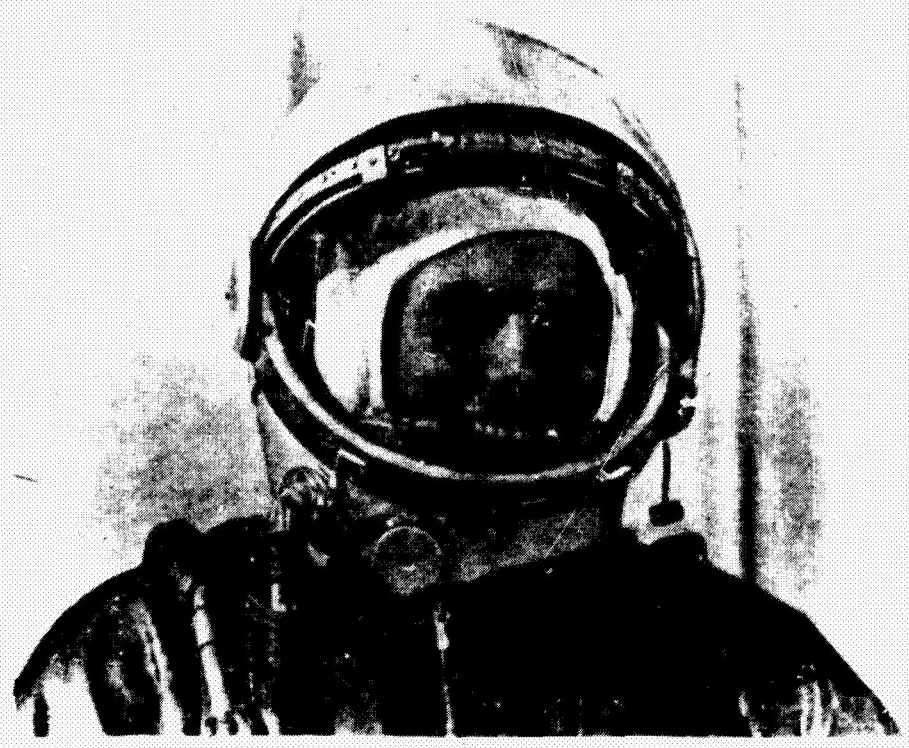
Those who were selected for the special group of future pilot cosmonauts had outstanding physical characteristics. To carry out the first cosmic flight in the world by a man, pilot Major Yuriy Alekseyevich Gagarin was selected from the group of pilot cosmonauts.

Yuriy Alekseyevich is a representative of the young generation of Soviet pilots. He was born in 1934. He spent his childhood in Gzhatsk, in the Smolensk area. He studied in the trade school, and then in the Saratov Industrial Technical School. The dream of flight above the clouds interested the young student. He joined the aeroclub to study piloting. In the military air forces, the mastery of the military pilot was polished. After successfully completing the Orenburg Aviation School, Gagarin served in aviation chast's of the Armed Forces. Here he developed the qualities of a daring air warrior, necessary for accomplishing his feat.

Even Roman Odd

When the selection of pilots for cosmonaut training began in the aviation chast's of the Armed Forces, there was no shortage of volunteers. Yuriy Alekseyevich was one of the first to submit his application and was included in /394
the group of pilot cosmonauts. He passed successfully through all stages of preparation for cosmic flight.

The first human cosmic flight took place thus. After the launch, under conditions of constantly increasing overload during the active part of the flight, Gagarin felt well and maintained uninterrupted radio communication with the ground control center of the flight. He accurately noted the moments of sequential separation of the rocket carrier stages. The noise in the cabin of the cosmic ship Vostok did not exceed the noise in the cabin of a jet aircraft.



Pilot-Cosmonaut of the USSR Yu. A. Gagarin

After the ship was in orbit, there was a feeling of weightlessness. Yuriy Alekseyevich quickly mastered himself in this state. According to the mission and program of flight, the first pilot-cosmonaut in the world checked the operation of the ship's equipment, made observations through the windows and the optic orientation device, maintained communications with the ground, recorded data of observation in an onboard journal and on a tape recorder. To develop experience for future prolonged flights, Gagarin took food and water.

The earth was well visible. Through the windows, the first cosmonaut /396
clearly observed the shore lines of continents and nations, large rivers, the relief of the earth's surface, forest masses, clouds and cloud shadows on the surface of the earth. The sky was completely black. The stars shown more clearly in it and were more sharply visible, than from earth. The earth was

framed in a very beautiful light blue hal[illegible] The colors at the horizon changed from soft sky blue through sky blue, blue, violet to the black color of the sky. When coming out of the earth's shadow, it was possible to see a bright orange color at the horizon, which then became all the colors of the rainbow.

At 9:51, 44 minutes after launch, the automatic orientation system of the ship was switched on. After coming out of the shadow of the earth, it sought the sun and oriented the satellite ship. At 9:52, cosmonaut Gagarin gave one of the communications about his well being and the normal operation of the onboard apparatus from the region of Cape Horn. At 10:15, the automatic program installation gave commands to prepare the onboard apparatus to switch on the braking engine. At 10:25 the braking engine was switched on, and the ship went from the orbit of an earth satellite to a descent trajectory. At 10:35, the ship began to enter the dense layers of the atmosphere. Gagarin took the overload well while entering the dense layers of the atmosphere and at 10:55 landed normally in the region assigned by the program.

Pravda wrote, "The first flight into cosmic space in the history of mankind, made by the Soviet cosmonaut Yu. A. Gagarin in the satellite ship Vostok, made it possible to draw a conclusion of enormous scientific significance about the practical possibility of human flights in the cosmos. It demonstrated, that a man can normally bear the conditions of cosmic flight, launching into orbit and return to the surface of the earth. This flight demonstrated that under conditions of weightlessness a man completely maintains his capability of workings, the coordination of his movements and his clearness of thought.

The flight yielded acceptionally important information about the operation of equipment in the cosmic ship. It completely confirmed the correctness of scientific and technical decisions made in its design. It confirmed the reliability of the rocket carrier and the design perfection of the satellite ship" [387].

Military pilot Gagarin carried out the first flight superbly along the planned cosmic path. His composure, confidence, knowledge of his business, fearlessness and pleasant smile seemed to embody in one man the best characteristics of Soviet youth in the 60's of the 20th Century. /397

The first successful flight in cosmic space encouraged the scientists, engineers and cosmonauts. The secrets of heaven were opened for mankind. New physical phenomena, a new medium, new conditions of flight attracted the searching mind to new daring. Our nation gave the cosmonauts all that was necessary for longer flights. Several Vostok ships were constructed. These ships played a significant role in mastering cosmic space and piloted flights were carried out on a complex program.

At 9 o'clock on 6 August 1961 by Moscow time, a new successful launching of a cosmic satellite ship Vostok-2 piloted by pilot cosmonaut Major German Stepanovich Titov, was made from the Baykonur cosmodrome. The satellite ship was put into elliptical orbit with a minimum distance from the surface of the earth of 183 kilometers and a maximum of 244 kilometers. The angle of inclination of the orbital plane to the equator was 64°56'. The initial period of

revolution of the ship around the earth (first orbit) was 88.46 minutes. The selection of orbital parameters for the cosmic ship Vostok-2 was to a significant degree determined by the requirements of assuring safe flight for the pilot cosmonaut.

The ship Vostok-2 consisted of a pilot cabin, an instrument section and a section with the braking engine installation.

The cabin contained systems for life support, flight control, part of the radio equipment, the onboard log, television cameras for observing the cosmonaut in flight. The cosmonaut was in a special chair, which was constructed to ensure automatic safe separation of the cosmonaut from the ship and his landing in case of emergency in launch or during the active part of the flight. In the chair, there was reserve oxygen and a ventilating system to ensure the comfort of the cosmonaut, clad in his spacesuit. The support surface of the chair was made of soft plastic shaped to fit the body.

The air conditioning and pressure regulation apparatus automatically maintained a normal gas mixture, humidity and air pressure in the cabin. The cabin of Vostok-2 had a new regeneration installation which was improved over the analogous installation in the ship Vostok-1.

Specially prepared food (juices, chocolate, meat pies and so forth) was in tubes and water was in a tank with a tube and mouth piece.

The flight was planned for 17 revolutions (about one day's time), however /398
the design of the ship, the supplies of food, water and reagents for the regeneration system could have provided a longer flight. In accordance with the mission, during the flight the cosmonaut observed the operation of the onboard apparatus, twice tried the manual control system of the ship, made visual observations and took pictures with a Konvas press camera, systematically conducted radio communications sessions with the earth, performed physical exercises and so forth.

The television apparatus aboard the ship Vostok-2 made it possible to objectively judge how the cosmonaut was feeling and evaluate the coordination of his movements in carrying out various tasks. The television transmissions from the cosmos to the earth obtained in this flight were then used by Soviet television broadcasting stations.

The basic difference between the second cosmic flight and the first was /399
that it was more prolonged, more filled with scientific investigations and observations. The principle important problem was studying the influence of prolonged weightlessness on the orientation of a man in space, the coordination of his movements, the functioning of the heart and circulation system and the digestive system and psychological conditions. It was no less important to study the possibility of normal cosmonaut life activity in prolonged flight, his working capacity, ability to take food, sleep and so forth. A fast program of medical observations included the study of the daily cycle of the cosmonauts life.

Before the Launching of G. S. Titov

The launching and active part of the flight went normally. After entry into orbit and engine shut-off, the condition of weightlessness began. The first sensation, according to the words of Cosmonaut G. S. Titov, was original: it seemed to him that he was flying upside down. But after a few seconds this sensation disappeared. The cosmonaut became accustomed to the condition of weightlessness and learned to carry out various operations planned in the flight mission. The basic and most important result of G. S. Titov's flight in the ship Vostok-2 was the fact that it was demonstrated that a man retains his full working capability throughout an entire 25 hour time in the cosmos.

In a press conference of 11 August 1961, Titov said, "The program of the flight was completely carried out... It was very interesting to observe the earth from the cosmos. It is possible to distinguish rivers, mountains, tilled fields... Clouds are clearly visible. They can easily be distinguished from snow, by the shadows which they cast on the surface of the earth. From time to time the horizon of the earth appeared in the window, a very interesting picture, the transition through all colors of the rainbow from the illuminated earth to the black sky and the light blue halo" [388].

G. S. Titov's long stay in conditions of weightlessness and the descent from orbit after the body had begun to accommodate to the absence of overloads were not reflected in the state of health of the cosmonaut. However, in the course of the flight (on some orbits) some disturbance was noted in the

operation of the cosmonaut's vestibular apparatus. Processing the data obtained showed that under conditions of weightlessness disturbances in the interaction of the spatial analyzers and changes in the threshold of sensitivity of the vestibular apparatus are possible. These disturbances can cause symptoms reminiscent of those in sea sickness.

It is worth noting that the signs of change in the vestibular apparatus mentioned above almost completely passed as soon as the cosmonaut took up the initial set-up position and did not make sharp movements of the head. The phenomena noted were strongly reduced after sleep and completely disappeared as soon as overloading began in the ship's return to the earth. /400

All the life support systems of the ship Vostok-2 worked normally. The cosmonaut regulated the temperature in the cabin independently; it varied from 10 to 25° Celsius. The humidity of the air was 50 to 70%, the oxygen content 25 to 27% and the carbon dioxide 0.25 to 0.4%.

Having made 17 revolutions and travelled a path of more than 700,000 kilometers, the satellite ship Vostok-2 and the pilot cosmonaut G. S. Titov successfully landed at 10:18 on 7 August in the region of the small village of Krasnyy Kut, Saratov area.

This flight had very great significance for the development of Soviet astronautics, and breathed creative energy into a large collective for further achievements in conquering the cosmos. It became clear that prolonged human flights in the cosmos are completely possible and safe for the cosmonaut's organism.

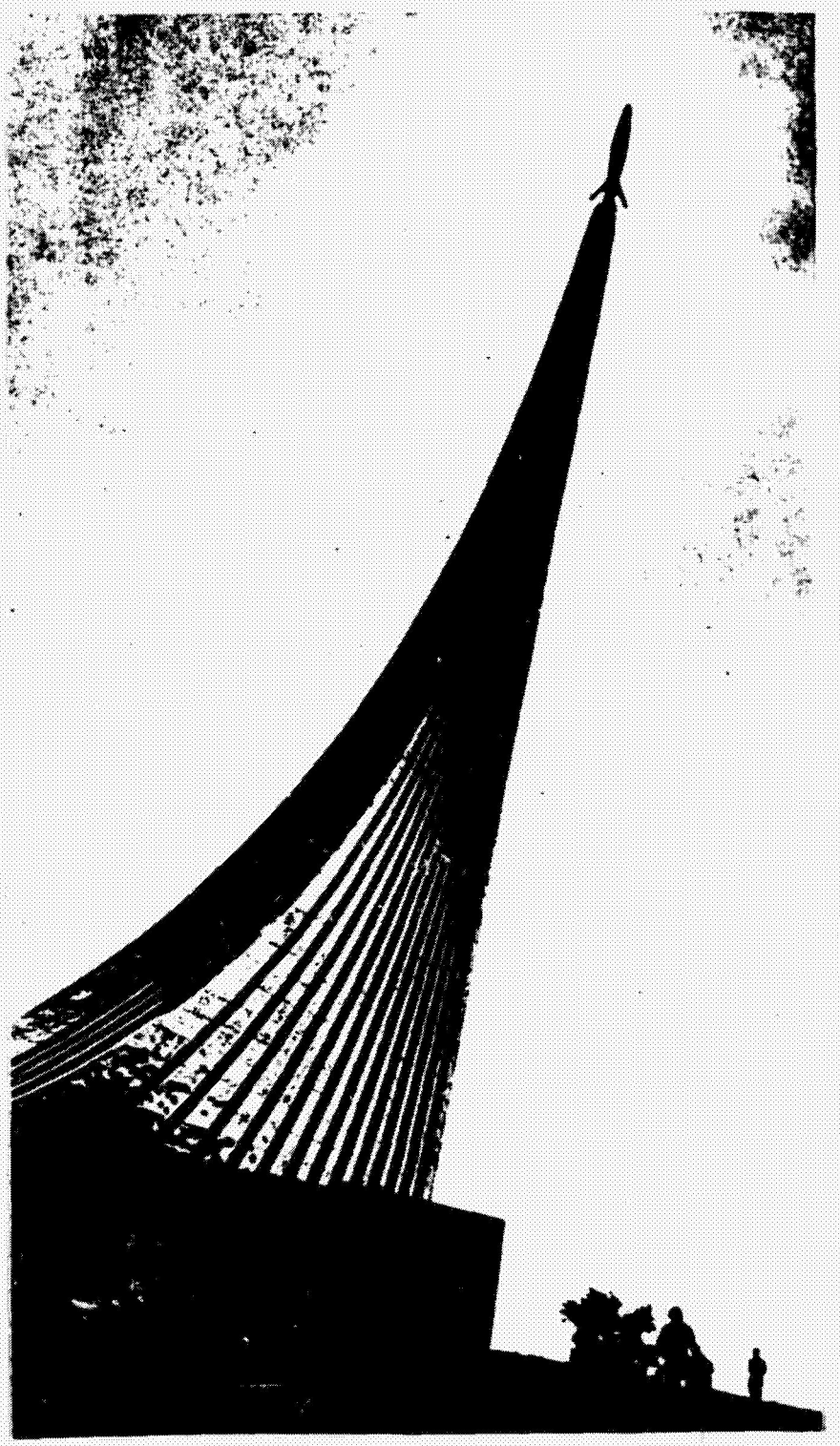
The successful one day flight of cosmonaut G. S. Titov demonstrated that the state of weightlessness, like the other physical conditions in the cabin of a cosmic ship, does not interfere substantially with the working capability and sleep of a man, and that it is possible to live and work in the cosmos.

In our nation during 1962-1963, two group (pair) flights of Vostok class cosmic ships were made. Table 5 gives the basic data of these flights.

TABLE 5

Cosmic ship	Pilot-cosmonaut	Launch	Period of the first orbit	Altitude, km		Finish (landing)
				perigee	apogee	
Vostok-3	A.G.Nikolayev	8/11/62 11:30	88.33 min.	180.7	234.6	8/15/62 on the 65 rev. at 9:52
Vostok-4	P.R.Popovich	8/12/62 11:02	88.39 min.	179.8	236.7	8/15/62 on the 49 rev. at 9:59
Vostok-5	V.F.Bykovskiy	6/14/63 15:00	88.40 min.	175	222	6/19/63 on the 82 rev. at 14:06
Vostok-6	V.V.Tereshkova	6/16/63	88.30 min.	181	231	6/19/63 on the 49 rev. at 11:20

Press Conference Connected with the Successful Flight of the Ships Vostok-5 and Vostok-6. June 1963.



Monument in Honor of the Outstanding Achievements of the Soviet People in Mastering Cosmic Space.

/401

In the first group flight of the ships Vostok-3 and Vostok-4, brilliantly carried out by the pilot-cosmonauts Andrian Grigor'evich Nikolayev and Pavel Romanovich Popovich, many important scientific technical missions were performed. There was a practical test of the working of all assemblies in the cosmic ship Vostok under the conditions of a flight of several days. For the first time, the set of apparatus for the observation of a second cosmic ship in orbit close to a first cosmic ship previously launched in orbit, was used. In the flight, there were practical tests of the radio communications between ships at different distances from each other. The group flight made it possible to work out a complex of ground control means for several cosmic ships operating simultaneously in close orbits.

In the second group flight of the ships Vostok-5 and Vostok-6, the Soviet woman Valentina Vladimirovna Tereshkova was the first on the cosmic paths. On this flight, cosmonauts V. F. Bykovskiy and V. V. Tereshkova investigated the influence of various factors of cosmic flight on the organism of men and women. In addition, the goal was pursued of checking the effectiveness of methods of selection and special training for cosmonauts. The group flights provided vast experimental material. We note only some aspects of the positive experience from the flights conducted.

The special training of pilot-cosmonauts gave good results. All four flights in the ships Vostok-3, 4, 5 and 6 went extremely successfully, and deviations from norms under conditions of weightlessness were not observed. Cosmonaut V. F. Bykovskiy separated himself from his seat for up to an hour and a half on four occasions (after 18, 34, 50 and 66 revolutions) and moved freely about the cabin of the ship; for shorter periods of time, cosmonauts A. G. Nikolayev (three and a half hours) and P. R. Popovich (three hours) separated themselves from the support system. Being in a state of weightlessness (up to five days) did not induce any noticeable changes in the daily course of psychological processes in the cosmonauts organisms. The working capability of the cosmonauts was preserved throughout all flights and the planned programs were able to be carried out. Feeding also took place normally. The life supp support systems worked completely satisfactorily and provided the necessary comfort.

In the group flight of cosmonauts Nikolayev and Popovich, the first radio cosmic communications in history were set up. The radio communication system worked stably and reliably at all ranges from 6.5 kilometers (the minimum distance between the ships Vostok-3 and Vostok-4) to the maximum, which at the end of the flight was approximately 3,000 kilometers. In this same flight, the problem was first solved of directly communicating pictures from on board cosmic ships for millions of television viewers. /402

The launching into orbit of the ships Vostok-4 and Vostok-6 demonstrated extremely high accuracy in launch time for the rocket carriers and in the final parameters (speed and altitude) of the active portion of the flight. From the table given above, it is evident how close the orbits of all four ships were. The ground service and coordination computation center obtained useful experience in simultaneously tracking groups of orbital targets.

The cosmonauts who participated in these two group flights carried out a vast program of scientific observations: photographs were obtained of the sun, the starry sky and the earth's surface, many measurements were made of radiation background, making it possible to more accurately fix the lower boundary of the earth's radiation belt, and systematic observations were carried out on the cloud cover of the earth.

The first flight in history by a woman cosmonaut V. V. Tereshkovoy had enormous social political significance. The entire world was once again shown the true equality of rights of men and women in our nation, the daring, intelligence and mastery of a Soviet woman, liberated from the shameful yoke of capitalist "civilization", were demonstrated.

In a statement of the Central Committee of the Communist Party of the Soviet Union on the occasion of the successful completion of the flights of the cosmic ships Vostok-6 and Vostok-6, it was stated:

"In this happy and jubilent hour, the Soviet people remember with a feeling of great pride and admiration that it was our countrymen who were first to penetrate the cosmic distances, that the morning of the cosmic era began on our land. The Soviet Union launched the first artificial earth satellite

into orbit, first planted the banner of the USSR on the moon, first launched satellite ships into the cosmos with living creatures, first sent a man on the previously unknown cosmic road and achieved great victories, which are applauded by all progressive humanity".[389]

The accumulated positive experience from the flights of the Vostok class cosmic ships made it possible for Soviet astronautics to go on to even more difficult programs of flights in larger and more improved cosmic ships.

The Vostok class cosmic ship was one place. To carry out a vaster program of scientific investigations and receive more objective results from the primary observations of new phenomena in cosmic space, multi-place cosmic vessels /403
of the Voskhod class were developed in the Soviet Union.

On 12 October 1964, a three-place piloted Voskhod ship was launched into earth's satellite orbit. The launching of the ship took place at 10:30 Moscow time. The period of revolution around the earth was 90.1 minutes, the minimum distance from the surface of the earth (perigee) 178 kilometers, the maximum (apogee) 409 kilometers and the angle of inclination of the orbit to the plane of the equator was approximately 65°.

The Voskhod ship differs from the Vostok ship. It has a three-place cabin for pilots, new instrumentation, and a number of systems which are new in principle. For example, to shift the Voskhod ship from satellite orbit to a descent trajectory, two braking engine installations were installed on it. This made it possible to chose a higher orbit with a period of revolution greater than the period of the Vostok ships by approximately two minutes. A new television system provided transmissions not only from the cabin, but the transmission to earth of pictures observed from on board the ship; this system was used by the crew as a periscope on a submarine is used for the observation of surrounding space. The system of soft landing on the earth was also new; it provided the landing of the pilot's cabin of the ship with practically zero speed. The first cosmonaut crew in history made a flight without spacesuits; this required unusually high reliability in the cabin seal.

The basic goals of the flight of the three-place Voskhod ship were: testing the design and use characteristics of the new cosmic ship, its systems and equipment, and also investigating the working capacity and cooperation during the flight of the members of the crew with various specialties.

In addition, tests were made during the flight of the work and rest schedules and the interchangeability of crew members at several stages of the flight, and the study was continued of the influence of various factors of cosmic flight on the human organism.

The commander of the ship Voskhod was engineer Colonel Vladimir Mikhaylovich Komarov, and his scientific coworker Konstantin Petrovich Feoktistov was responsible for carrying out physical technical investigations. Medical biological investigations and observations of the crew members were carried out by Doctor Boris Borisovich Yegorov.

The ship Voskhod circled the earth 16 times, and after successfully carrying out the assigned program, the landing was safely made at 10:47 on 13 October 1964.

In the published materials from the observations of the Voskhod crew, there is very important information.

The experimental data about the structure of boundaries at the horizon /404
obtained on this flight is necessary for the selection of a guide layer in the optical wavelengths for the design of navigation instruments. Observations of the starry sky and the largest stars were made to test the possibility of orienting a ship by the stars; for this same reason, astronavigation measurements were made with a sextent.

The members of the crew investigated the behavior of liquids under conditions of weightlessness. Doctor Yegorov took comparative vestibular samples under conditions of weightlessness and also made an analysis of the physiological parameters of the crew members at various moments of the flight.

The remarks of cosmonaut K. P. Feoktistov during the active portion of the flight (while being put in orbit) are very interesting. He write, "...When you look from the side at the launching of the rocket carrier, it makes an unusual impression: the rumble of the rocket engines, the blinding flames from the jets, the rocket itself, lifting into the sky, slowing turning into a bright point and then vanishing into the infinite. It is a gracious and colorful picture.

However, in the cabin of the ship, all this is received somewhat more simply... It all takes place even a little trivially:

- a soft separation from the earth;

- a noise which is not too loud (comparable to the noise in the cabin of a contemporary jet liner;

- vibrations which are not too great; the lower frequencies are basically only in the transsonic region;

- a slight rocking of the rocket, reminiscent of the rocking of a train in motion;

- easily bearable overloads. At the end of operation of each stage, they naturally increase..."[390]

The flight of the three-place cosmic ship Voskhod went normally at all stages. The program for entry into the dense layers of the atmosphere was extremely successful: the overloads were reduced and the cabin landed without shocks and bumps.

This flight was a new success for Soviet astronautics in the mastery of cosmic space.

Even Roman odd

In the works of K. E. Tsiolkovskiy on astronautics, what seemed to be the most fantastic plans were considered, for the launching of a man into the cosmos and the assembly of great cosmic stations in artifical earth satellite orbits from parts brought to these orbits by rocket carriers. Our times have seen the achievement of many of the great scientists brilliant ideas.

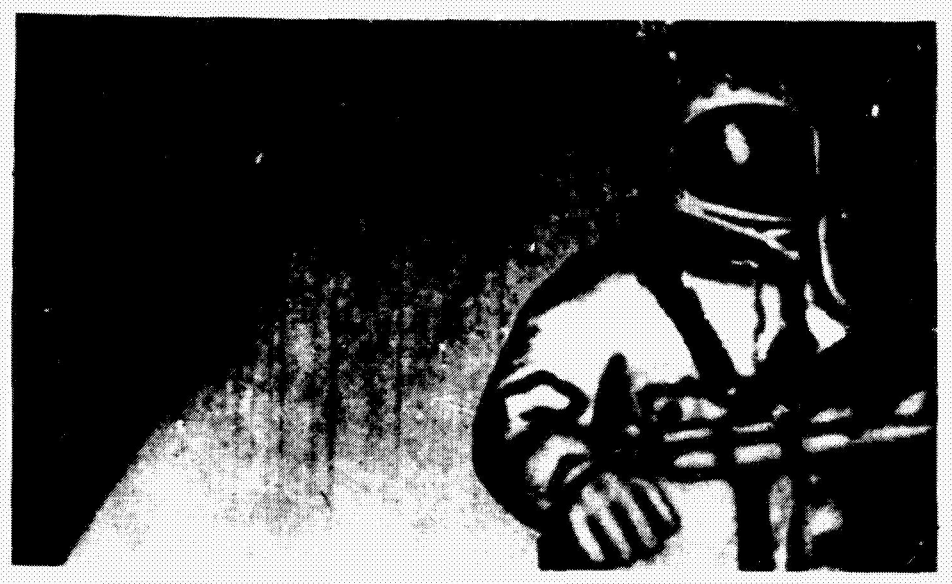
On 18 March 1965, at 10 o'clock Moscow time, a powerful rocket carrier launched the artificial earth satellite cosmic ship Voskhod-2 from our nation into orbit, piloted by a crew consisting of the ship commander pilot cosmonaut Colonel Pavel Ivanovich Belyayev and second pilot, cosmonaut flier Aleksey Arkhipovich Leonov. /405

The cosmic ship was placed in an orbit with the following parameters: minimum distance from the surface of the earth (perigee) 173 kilometers, maximum distance from the surface of the earth (apogee) 495 kilometers, period of revolution 90.9 minutes, angle of inclination of the orbit to the equator 65°.

On 18 March 1965, at 11:30, for the first time in the history of the mastery of the cosmos, there was an exit of a man from the ship Voskhod-2 into cosmic space. On the second revolution of the flight, flier cosmonaut A. A. Leonov, wearing a special space suit with an automatic support system, made an exit into cosmic space, separated himself from the ship to a distance of five meters, successfully conducted the set of planned investigations and safely returned to the cabin of the cosmic ship. The total time during which Leonov was in open cosmic space was about 20 minutes, including 10 minutes outside the ship.

This is how flier cosmonaut A. A. Leonov tells about the outstanding experiment, "Immediately after getting into orbit, we began to prepare the experiment. Before I went into the lock chamber in the cabin of the ship, the commander helped me to put on the automatic life support system pact... We checked the operation of the equipment, systems and registration apparatus... We equalized the pressure in the chamber and the cabin. Then we opened the hatch from the ships cabin to the lock chamber and through this opening I floated into the chamber." Then the commander of the ship P. I. Belyayev "closed the cover of the hatch from the ships cabin. Having taken pressure from the chamber, he opened the cover of the exit hatch. A blinding beam of sunlight filled the lock chamber. ...Finally all was ready and I could go out. My head appeared beyond the line of the output hatch.

"The immerse cosmos lay before me in all its indescribable beauty. My first glance was at the earth. It floated majestically before my eyes. ...Without haste, I pull myself out of the lock and then, lightly pushing on the hatch, separate myself from the ship. The line connecting me to the ship stretched out to its full length, and my movement away from the ship ceased. ...I expected to see sharp contrasts of light and shadow, but there was nothing like it. The parts of the ship in shadow were fairly well illuminated by the reflection of the sun's rays from the earth. I pulled the line a little towards myself and began to slowly approach the hull. ...I convinced myself that, having become accustomed to it, it was possible to move around fairly accurately and with coordination in these unusual circumstances" [391]. /406



A. A. Leonov in the Cosmos.

By this experiment, Soviet astronautics showed the whole world that a man cannot only make a flight inside a cosmic ship, but operate actively in cosmic space, carrying out observations and other operations, in a word, can work in the cosmos.

As a result of the experiment, a vast amount of material was obtained confirming the maintenance of working capability by the cosmonaut, the good coordination of his movements, the normal state of his pulse, breathing and other physiological parameters. Data was obtained about the working of the spacesuit in conditions of total vacuum; the heat regime of the cosmonaut under conditions of freefall in cosmic space was checked; the means of communication with the commander of the ship were tested in unusual conditions.

The flight of cosmonauts Belyayev and Leonov has enormous significance for subsequent work in mastering cosmic space.

On 23 April 1967, pilot cosmonaut V. M. Komarov set out on his second cosmic flight aboard the ship Soyuz-1. However this flight ended tragically. Vladimir Mikhaylovich perished.

Astronautics expects great achievements in the future. The most daring dreams become reality before our eyes. Humanity stands on the threshold of man's conquest of the moon. It is possible for piloted cosmic ships to make flights to the nearest neighbors of our planet, to Mars and Venus. The system of artificial earth satellites (meteorological, communications, navigation, geodesic) will surely work to satisfy the daily requirements of the national economy. /407

It is probable that orbital aircraft will become a technical reality in the near future. They will be able to carry cargoes, mail and passengers to

any point on the globe in less than an hour.

K. E. Tsiolkovskiy, the patriarch of scientific astronautics, wrote at the beginning of the 20th Century, "At the beginning inevitably come: thought, dream, fairy tale; behind them follow scientific calculation, and finally at the end the thought is crowned with accomplishment".

A reliable pledge that new daring concepts of the Soviet people for the mastery of the cosmos will be brought to life is the direction by the Communist Party of the most important undertakings in the development of rocket technology and astronautics in our nation.

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NASA

CHAPTER 9

THE CIVILIAN AIR FLEET

ABSTRACT. The founding and development of the Civil Air Fleet are described. Particular attention is turned to the activities of the Civil Air Fleet in such areas as artillery spotting during the second world war. Photographs of cargo and passenger aircraft, crop dusters, etc. are presented.

Founding of the Civilian Air Fleet /408

Our civilian aviation was founded in the years of Soviet power. By the will of the Communist Party and the efforts of all Soviet people, a first-class air fleet was built in a short time, capable of supplying the needs of the rapidly growing national economy of the socialist state.

The founding of civilian aviation is closely connected with the name of the organizer and leader of our Party and state, V. I. Lenin. He understood well the significance of aviation for such an enormous nation as ours, and foresaw its great future. By an order of V. I. Lenin, questions of the application of aviation in the national economy and cultural construction were the subject of discussion even in 1918.

In the years of the Civil War, V. I. Lenin repeatedly presented the problem of using the aircraft as a means of operational communication and as transportation for fast government mail. When the Hungarian Soviet Republic was proclaimed in March 1919, sharply in need of help and support, V. I. Lenin immediately sent a letter to the noted Hungarian Revolutionary Bela Kun, in which he wrote, "Try to organize postal service with us by airplanes"[392].

The first aircraft flights with passengers and mail indicated the possibility of applying aviation widely for purposes of the national economy. In 1921, the Communist Party and the Soviet government took a series of measures intended to found civilian aviation and organize its application to the national economy. On 17 January 1921, a decree of the Council of Peoples' Commissars of the Russian Soviet Federated Socialist Republic was issued, "On air transportation". This decree signed by Lenin established "the basic rules for air /409
transportation in the air space above the territory of the Russian Federated

Soviet Republic and over its territorial waters". The decree determined the rules for using the air space of our nation by aircraft of civilian and military aviation, defended the sovereignty of the air space above the territory of the Soviet Republic and above its territorial waters and established a flight procedure for foreign aircraft above the territory of our motherland.

This important Leninist document laid the foundations of Soviet air regulations and established the necessary conditions for the development and wide application of aviation in the national economy. Wide preparation was made to open regular air passenger service. By May of 1921, the first flights from Moscow to Khar'kov had already been made on the aircraft Il'ya Muromets.

Work went on intensely in preparation for the opening of the first international passenger airline from Moscow to Koenigsberg. In September of 1921, a resolution of the Council of Peoples' Commissars, signed by V. I. Lenin, was published on the organization of air communications between our nation and Germany. This resolution called on the Peoples' Commissariat of Trade, by agreement with the Peoples' Commissariat of Foreign Affairs, the Peoples' Commissariat of Post and Telegraph and the Central Administration of the Air Fleet, to enter into discussions with German firms on the question of setting up a mixed Russian-German society for the organization and exploitation of an airline from Moscow to Koenigsberg. 250,000 gold rubles were assigned to the organization and equipment of the airline.

In May 1922, regular flights were opened on the Moscow-Koenigsberg line, which at the time had great significance for the development of trade, communications and diplomatic relationships between the Soviet Socialist Republic and western states.

In the summer of the same year, air communications were organized between Moscow and Nizhnii Novgorod. Fifty seven flights were made that summer. The newspaper Izvestiya was first taken to Nizhnii Novgorod by airplane and sold there at 12:00 on the day of publication.

In 1922, in accordance with the Leninist decree, "On air movements" the Central Administration of the Air Fleet issued a whole set of rules, in which the basic principles for the guidance of civilian aviation were laid out; the rules for obtaining pilots licenses, for registration of aircraft and for issuance of air worthiness certificates. Simultaneously, instructions were affirmed on the customs supervision of air courts.

By an order of the Revolutionary War Council of the Republic in December /410
of 1922, an inspection of the civilian air fleet was established within the Central Administration of the Air Fleet, to which great and important tasks were assigned: the study and evaluation of plans for the civilian application of the air fleet arising in various departments; the development of instructions and rules concerning civil aviation; the registration of aircraft, pilots and other workers in civil aviation.

Based on the experience available, our nation began a wide construction of airlines and the founding of a powerful civil air fleet. On 9 February 1923,

a resolution of the Council on Labor and Defense was published, "On assigning technical supervision of the airlines to the Central Administration of the Air Fleet and on the organization of a Council for Civil Aviation". The Central Administration of the Air Fleet was assigned overall technical supervision of airlines in the Russian Soviet Federated Socialist Republic. A new organization was established for the supervision of civil aviation, the permanent Council on Civil Aviation of the Central Administration of the Air Fleet. The Council on Civil Aviation had the function of supervising and directing all facets of activity in civil aviation. The Council worked out rules for opening new airlines, established the principles of their direction and maintained observation of the economic and administrative side of affairs. The previously established inspection of the Central Administration of the Air Fleet retained the function of controlling the technical side of using airlines.

The decision of the Soviet government on the organization of a Council for Civil Aviation had great significance. It supplied a unified state control for the activities of civil aviation from the very beginning of its development. Therefore, it is not by accident that February 9th is annually celebrated as the Day of Founding of Soviet Civil Aviation.

On 23 September 1923, the Council of Labor and Defense of the USSR took a resolution on setting aside areas of ground not less than 25 Desyatins [2.7 acres] in dimensions for the construction of airfields and landing areas close to cities and other populated points in the network of airlines confirmed by the Council of Labor and Defense of the USSR, and another resolution of 19 October confirmed the three year plan for opening airlines. These decisions played an enormous role in the construction of airfields, airports and all ground installations necessary for the development of airlines in our nation.

The Communist Party, guided by the instructions of V. I. Lenin, mobilized the forces of labor to set up an air fleet. The slogan issued by the Party, "Laboring people, built the air fleet!", found a lively response in the masses /411 and became the most popular slogan in the nation.

In the first years of construction of the civil air fleet, great attention was given to agitation flights in aircraft, which found great popularity with the population. The numerous flights carried out in those years also served to clarify the role of aviation and demonstrate its achievements. All this was a valuable means for attracting the workers to the question of building the air fleet.

In March 1923, voluntary society, Dobrolet, was established, whose regulations were confirmed by the Council of Peoples' Commissars of the USSR. The regulation read, "For the development of the civil air fleet within the borders of the USSR by the organization of airlines for the transportation of passengers, mail and cargo, for the production of aerial photographs and for other branches of application of the air fleet, on the basis of the national aviation industry, a giant stock society is established with the designation, 'Russian society of the volunteer air fleet' -- 'Dobrolet'".

The share holders of the society were Soviet state organizations and

establishments. The workers of the nation were widely drawn into participation in it. Shares costing one ruble were widely distributed among workers, peasants and employees for a total sum of about four million rubles. In the same year, a society of the Dobrolet type was established in the Ukraine, Ukrvozdukhput', and in the Transcaucasus -- Zakavia.

In 1923, Dobrolet opened flights on the first airline from Moscow to Nizhnii Novgorod over a distance of 420 kilometers and made preparation to open airlines in Central Asia.[393] In October of that same year, an agreement was concluded between the administration of the Dobrolet society and the chairmen of the Central Asiatic Republics on the organization in Central Asia of a branch of the society for the exploitation of airlines. According to this agreement, in 1924 flights were begun on air routes, Tashkent -- Alma-Ata, Khiva -- Bukhara and Bukhara -- Dushanbe.

Ukrvozdukhput' actively developed its operations. It opened several airlines: Moscow -- Khar'kov, Khar'kov -- Kiev, Khar'kov -- Odessa, Khar'kov -- Rostov and others.

A branch for aerial photography was set up in the administration of Dobrolet in March of 1924, and in the summer the first experimental aerial photographs were made in the area of Kalinin on an area of 520 hectares.

At the same time, Dobrolet made experiments in using aircraft for combatting the tests of agriculture. The cultivation of seeds was carried out with /412
pollenators made in the workshops of Dobrolet. The experiments gave positive results [394].

The rapid growth of Dobrolet's activities continued in 1925-1927. The airlines organized earlier were developed, and new ones were founded, in Central Asia, Siberia and the Far East: Chardzhou -- Khiva -- Tashauz, Frunze -- Alma-Ata, Verkhneudinsk -- Ulan-Bator. Preparations were made for opening airlines: Moscow -- Irkutsk and Irkutsk -- Yakutsk. At the end of 1927, flights began over a complex international route from Tashkent to Kabul.

By a resolution of the Council of Peoples' Commissars of the USSR on 21 September 1926, the Dobrolet society was converted from a Russian society to an All-Union society.

Soviet aviators started the conquest of the Arctic. Together with sailors, pilots of civil aviation made ice reconnaissance and participated in geographic investigations in the far north.

In 1926, flier M. S. Babushkin began his arctic flights over the White Sea to scout the seal grounds for flotillas of the animal slaughtering industry.

The activities of civil aviation, even in the period of its founding, developed on the basis of the national aviation industry. In 1924, the passenger aircraft Ak-1 designed by V. L. Aleksandrov and V. V. Kalinin and the agricultural aircraft, "the humpback gable" by V. N. Khioni successfully

passed flight tests and began to be used. Designer A. N. Tupolev made the first all metal passenger aircraft, the ANT-2. In 1925, the K-1 aircraft designed by K. A. Kalinin came into use. After them, aircraft of new types, made by A. N. Tupolev, K. A. Kalinin, N. N. Polnkarpov and other designers, appeared on the airlines of the civil air fleet.

However, in the first years of the civil air fleet's activities, national aircraft were not sufficient, and therefore foreign machines were used, primarily the German "Junkers" (Ju-13).

The year 1928 was significant in the development of civil aviation. The overall length of airlines reached 10,780 kilometers. The routes of Dobrolet penetrated far into the depths of Siberia and Yakutiya. In September, regular flights began on the longest airline in the nation, the Transsiberian airline from Moscow to Irkutsk, with a length of 4,565 kilometers. This new line had not only internal, but international significance.

In order to ensure more rapid flights on this route, for the first time in /413
the USSR, equipment was set up for two stages, near Moscow and in Siberia, for flights at night. On the night of 19 September 1928, the postal aircraft left to follow the route Moscow -- Kazan' -- Sverdlovsk -- Omsk -- Novosibirsk -- Krasnoyarsk -- Irkutsk, with landings in these cities to distribute and receive mail. After 50 hours, the mail reached Irkutsk. By opening this line, equipped for night flights, Dobrolet solved one of the most important and complex problems in the development of civil aviation in our nation.

In October 1928, the civil aviation of the USSR first took part in the international exposition in Berlin. At the exposition, the hospital aircraft designed by K. A. Kalinin and the agricultural "humpback gable" of V. N. Khioni were displayed. There were wide displays of the work of civil aviation in the struggle with agricultural pests and in aerial photography, and also the achievements in the development of air communications in our nation. The participation by the civil aviation of the USSR and the international exposition attracted great attention from the world public.

Together with the development of aviation technology and airlines, the cadre of civil aviation grew. With great enthusiasm, pilots, technicians and service personnel brought to life the decisions of the Communist Party and the Soviet government on mastering new aircraft and constructing airlines and airfields. They self-sacrificingly carried out the most complex assignments.

In 1928, in connection with the wreck of the dirigible "Italiya" the Soviet pilots B. G. Chukhnovskiy and M. S. Babushkin, by order of the government, took active part in the search and rescue for the Nobile expedition. These flights were carried out under very difficult arctic conditions and required great daring and high flight mastery.

Thus, in the first years of the Soviet power, the foundations were laid in our nation for the civil air fleet as one of the means of transport and communication. Great work in organizing and developing civil aviation was carried out by the directing workers of the Central Administration for the Air

Fleet, and in the first place by the chairman of the Council for Civil Aviation, A. A. Znamenskiy and his deputy P. I. Baranov. Much energy was contributed to the construction of the civil air fleet by chief inspectors I. S. Peresterskiy and V. I. Vishnev and the chairman of the administration of the Dobrolet society, V. N. Ksandrov. Among the first pilots of civil aviation were N. P. Shebanov, Ya. N. Moiseyev, A. I. Tomashevskiy, N. I. Naydenov, I. K. Polyakov, and among the air mechanics, V. P. Kamyshev, F. I. Groshev, I. V. Mikheyev, V. V. Osipov and many others.

A. I. Tomashevskiy

This was the first generation of civil fliers, engineers, air mechanics and technicians. They laid down the air routes in our nation under exceedingly difficult conditions. It was necessary to fly great distances above thinly populated regions in Central Asia, in the Urals and in Siberia, on aircraft not sufficiently equipped for flights under complex conditions. The weather service did not yet exist at that time. Experience in the exploitation of aircraft motor stocks was not available. Soviet people persistently learned how to better and more expediently use aviation in the interests of developing the national economy of the USSR, in the interests of constructing socialism in our nation. /414

New Air Routes /415

Great successes were achieved by civil aviation in the years of the pre-war five-year plans. Based on the policy carried out by the Communist Party of industrializing the nation, a powerful aviation industry was established, which was the material base for the growth of civil aviation.

The outstanding worker of the Communist Party and Soviet state, V. V. Kuybyshev, speaking at the first All-Union Conference of Workers in the Civil Air Fleet on 19 February 1931, said, "Civil aviation is a child of the new technology. The government therefore considers it possible to plan enormous steps in the area of civil aviation, steps which have not been dreamed of by any capitalist state" [395].

If the percentage of national aircraft in the total stock of civil aviation was 39% in 1929, by 1933 it had grown to 87.5%. Starting in 1935, only Soviet aircraft began to fly on the airlines of the civil air fleet.

In these years, civil aviation received the new machines, PS-3, K-5,

"Stal'-2", "Stal'-3", G-2 (ANT-6), MP-1, PS-40, the largest transport aircraft in the world ANT-14, "Maksim Gor'kiy" and others.

A rapid growth of new airlines and a reconstruction of existing airlines took place; airports, communications and radio navigation items and repair enterprises were built; scientific research institutions, training establishments and construction organizations were founded.

At the end of the first Five-Year Plan, the Soviet Union occupied the first place in the world for the speed of development of civil aviation. The Party gave the workers in the civil aviation fleet the task of overtaking and passing the capitalist nations in the area of civil aviation development, in a significantly shorter time then that planned for all branches of the national economy.

Considering the enormous capability for growth of civil aviation in our nation and its role in speeding socialist construction, the Party and government centralized the direction of the civil air fleet, took it under direct supervision and established exceptional conditions for its rise. In October 1930, based on a decree of the Council of Peoples' Commissars of the USSR, an All-Union Association of the Civil Air Fleet (VOGVF) was formed, under the direct leadership of the Council of Labor and Defense [396],which on 25 February 1932, /416
was transformed into the Central Administration of the Civil Air Fleet (GUGVF) of the Council of Peoples' Commissars of the USSR [397].

A great role in organizing the strengthening of the civil air fleet was played by the resolution of the Council of Peoples' Commissars of 19 May 1934, "On the reorganization of the organs of direction of the civil air fleet", according to which trusts were established in 1932 for transport aviation, agricultural aviation, construction, aviation repair and aviation supply, and their local organs were eliminated and replaced by 12 territorial administrations, called upon to establish direction of the work of all types of aviation [398]. These measures brought with them a significant reduction in the staffs of the administrative apparatus, and provided for better utilization of the aircraft-motor stock. By a resolution of the Council of Peoples' Commissars of the USSR on 17 December 1932 [399], the Central Administration of the North Sea Route in the Council of Peoples' Commissars of the USSR was organized, with polar aviation under its control.

In order to strength Party supervision and political work in the sub-units of the civil air fleet, the Central Committee of the All-Union Communist Party (bolshevik) and the Council of Peoples' Commissars of the USSR adopted a resolution in June of 1933 on setting up political sections in the territorial administrations, aviation groups and educational establishments of the Civil Air Fleet, and a political administration in the Central Administration of the Civil Air Fleet. A political administration was also set up in the Central Administration of the North Sea route.

The political organizers united the Communists of the administrations and sub-units, and did great work in the political education of the non-Party members among the aviation workers. In the sub-units of the Civil Air Fleet,

the Party organizations grew and were strengthened, the level of Party supervision was raised. Under the supervision of the political organizers, the Party organizations and the sub-units of the Civil Air Fleet conducted a struggle for the mastery of technology, the fulfillment of production plans, regularity and safety in flights and high culture in passenger service. They performed great ideological work, educating the aviation workers in the spirit of unlimited commitment to the Communist Party, Soviet government and socialist motherland. The political organizers established Party control over the fulfillment of the laws of the Soviet power, the resolutions of the Party and government and the rules of GUGVF, helped the command personnel to strengthen labor discipline, developed socialist competition among the workers of the Civil Air Fleet and assured the vanguard role of communists and komsomols in production.

Test Pilot V. K. Kokkinaki and Aviation Designer S. A. Il'yushin. 1966.

An enormous role in the development of civil aviation was played by Soviet /417 society. In 1931, on the initiative of the editors of the newspaper Pravda, a ten day period of help for civil aviation was conducted, in which committees arose in many important centers of the nation for cooperation in the development of civil aviation in the USSR. On the example of the Moscow Electrical Works, many establishments in the capital and other cities became patrons of civil aviation. Tens of new airfields, landing fields, hangars and other

installations appeared as the result of the entire peoples' assistance and patronage of the Civil Air Fleet.

Rocket Carriers in Flight. 1962.

From year to year, the amount assigned to capital construction increased. If in 1929, five million rubles were assigned to civil aviation, in 1933, it was 170 million rubles [400].

On 11 January 1931, the Council of Peoples' Commissars of the USSR resolved to make new construction for the Civil Air Fleet a top priority important objective in capital construction. The State Planning Committee, Higher Council on the National Economy and Peoples' Commissariat of Supply of the USSR were called upon to supply the Civil Air Fleet on a level with the

highest priority important objectives of capital construction. The Peoples' Commissariat for Communications Routes was called upon to make all shipments for the Civil Air Fleet on an urgent basis. The requirements of the Civil Air Fleet for work force and specialists had to be satisfied on a priority basis.

On 11 February 1931, the Council of Peoples' Commissars of the USSR ordered the state industrial enterprises to send their products to the Civil Air Fleet at the same prices at which they were sent for the Army and the Navy [401].

The Communist Party and Soviet government paid particular attention to the organization of scientific research institutions. At the beginning of 1933, the Civil Air Fleet had the following scientific research institutes: aircraft, aviation engine, special service and ground equipment (in Moscow); aviation and aerial photography (in Leningrad); internal combustion engine (in Kiev and Khar'kov); a scientific research and experimental use base for dirigible construction. The scientific research institute for agricultural aviation was transferred to the control of the Civil Air Fleet. These institutes played a great role in the development of the Civil Air Fleet, in the mastery of new technology and its correct utilization.

Great significance for the development of the Civil Air Fleet at that time belongs to the problem of training cadres. The training of cadres for civil aviation was conducted, considering their possible utilization if necessary in the interests of national defense. Speaking at the First All-Union Conference of Civil Air Fleet Workers, V. V. Kuybyushev said, "It is necessary to remember, that the nation as a whole and the government in particular place significant hope on the development of the Civil Air Fleet, not only because of its role in the economy of the nation, but also as a basis for defense in case military actions occur. The cadre for the future battles in the great struggle between capitalism and socialism will be drawn from those who study in the schools of civil aviation " [402]. /418

The gradiosity of the planned scale of development for the Civil Air Fleet required the development of a network of educational establishments that was planned even in 1931 to reach 15,000 students.

The special educational establishments of the Civil Air Fleet began to be founded in 1931. At the beginning of the third Five-Year Plan, those functioning included the Leningrad Institute for the Training of Civil Air Fleet Engineers, the Moscow Dirigible Construction Institute, the Aviation Faculty of the Kiev Polytechnical Institute (converted in 1933 to the Aviation Institute), the aviation schools in Leningrad, Moscow, Kiev, Saratov and Gor'koy, the united schools for pilots and aviation technology in Bataysk, Tambov and Balashov [403]. Cadre for the Civil Air Fleet were trained in higher technical educational establishments and technical schools, and through a system of various courses in the Central Correspondence Study Combine.

At the beginning of the first Five-Year Plan, the length of the network of airlines in the USSR was 9,326 kilometers, and together with the lines of the Russian-German joint stock society, "Deruluft", 11,442 kilometers. In the

years of the first Five-Year Plan, it was increased three times, reaching 31,934 kilometers [404].

The construction of new airlines was carried out in accordance with the directives of the 17th Party Conference and the 17th Congress of the All-Union Communist Party (bolshevik).

The 17th Party Conference suggested, "That air communications be developed along all the major lines, as one of the most important means of communication with remote regions and with important industrial centers". This decision was confirmed by the 17th Congress of the Party, which set up the task, "For the Civil Air Fleet, the net of airlines of union significance must increase in the second Five-Year Plan from 32,000 kilometers to 85,000 kilometers, i.e., almost three times. Together with this, it is necessary to develop a wide construction of local airlines, with an increase in their total length in use in 1937 to 35,000 kilometers"[405].

The construction of airlines took place primarily in those regions where /419
other forms of mechanized transport were lacking and where for this reason, civil aviation played an important role in performing political, economic and cultural missions.

In the second Five-Year Plan, the length of airlines of union significance grew to 62,500 kilometers, and lines of local significance grew to 43,600 kilometers.[406] For length of airlines, the Soviet Union took second place at the end of the first Five-Year Plan, and first place in the world at the end of the second Five-Year Plan. At the beginning of 1941, the net of airlines reached 146,000 kilometers [407].

The capital of our motherland, Moscow, was connected by air communications with all the republics, areas and important production centers, with the capitals of western Europe and the Near East.

In the decision of the 18th Congress of the All-Union Communist Party (bolshevik) there was an order to, "Concentrate the work of civil aviation on the basic state lines. Improve the technical equipment of air trunk lines, widening and improving ground installations"[408].

The role of the Civil Air Fleet in the pre-war period in the political, economic and cultural life of the nation, and in socialist construction, can be judged by the extent and character of aviation transportation which grew every year.

In 1928, 7,022 passengers, amounting to almost 64.8 tons and 8.3 tons of cargo were transported, but by 1940, 403,000 passengers, almost 14,900 tons, and 47,900 tons of cargo were moved[409].

At the end of the second Five-Year Plan, the Soviet Union took first place in the world for volume of postal and cargo aviation transportation.

In the first Five-Year Plan (beginning July 1931) the delivery by aircraft

Even Roman

of the masters for the newspaper Pravda from Moscow to Leningrad, Khar'kov, Sverdlovsk and a number of other cities was organized.[1] In the following years, the number of different papers and the points of delivery of their masters grew steadily. With a feeling of high responsibility, the transport of masters was sharply carried out under any meteorological conditions by the experienced pilots K. A. Reshetnikov, M. A. Nikiforov, S. D. Dobrynin, S. Ye. Gorshkov and others.

In addition, transport aviation was used for delivering literature to /420
outlying regions of the country, and also for delivering agitators and members of election commissions during elections to the Supreme Soviet of the USSR and the United Republics.

The aircraft carried sulfur, zinc concentrate and polymetallic ore from mines to transpor. arteries, ball bearings for tractor factories, spare parts, instruments and accurate mechanical work pieces for many enterprises of the nation.

Air transport was widely utilized for exporting furs, silks, precious metals and other articles of export from remote regions; for urgent transportation of medical preparations, vaccines, serums, berries, fruits, vegetables, fresh fish and other perishable cargoes; for delivering articles of culture, medicines, food products in roadless regions, fuel and spare parts for tractors and other agricultural machinery in special cases during the period of seeding and harvest campaigns.

The aviators displayed hardiness, great work capability and mastery. Widely famous among our people are the transport aviation pilots N. P. Shebanov, a master of flights under complex meteorological conditions, who mastered more than 60 types of aircraft and was the first in the Civil Air Fleet to fly a million kilometers; V. I. Chulkov, one of the oldest pilots, outstanding in piloting heavy ships; B. L. Tsvetkov, pilot instructor in an aviation school, later worker in the Central Inspection; N. I. Novikov, one of the first pilots of civil aviation; I. S. Zakharov, V. A. Romanov, I. F. Byvalov and many others. In the years of the pre-war Five-Year Plans, a great contribution to the development of civil aviation was made by pilots V. A. Drozdov, who was among the first to learn the tech ique of aircraft piloting by radio beacons, A. A. Balenko, S. N. Fokanov, P. .. Rybin, B. A. Konsulaki, P. Ya. Kirichenko, B. V. Bitskiy and others.

In the period of the pre-war Five Year Plans, there was a significant increase in the amount of work by special purpose aviation. The collectiviza- /421
tion of agriculture established favorable prerequisites for the wide utilization of aviation in the struggle with pests and plant diseases. The amount of aviation chemical work in agriculture and forestry was 27 times greater in 1940 than that in 1928. Aircraft began to be used for very early planting, aerial appraising of forests, acceleration of snow melting, battling Steppe and forest fires, early or late frost and rodents, for transporting baby chicks,

[1] The circulation of Pravda grew from 1.5 to 3.1 million copies in the first two or three months of the delivery.

N. P. Shevanov

fish-fry and fruit tree seedlings, in the interests of developing poultry production, fish production and the cultivation of orchards. From 1930, aviation began to be utilized to battle the larva of the malarial mosquito.

Aviation found wide application in other branches of the national economy: in the sea animal and fish industry, in scientific expeditions and in public health. From year to year, the territory covered by aerial photography grew. The Civil Air Fleet of the USSR took first place in the world in all types of special application aviation work in the first Five-Year Plan, and has held it firmly ever since then.

The pilots of the special application aviation sub-units accumulated great experience and became masters of their business. The whole nation knows the special application aviation pilots B. F. Shvedov, N. I. Yegorov, K. P. Mikhaylov, P. M. Filatov and many others.

The work of polar aviation achieved great scope. In the years of the first Five-Year Plan, aircraft were utilized in the north to study the movements of ice, improve maps of the Arctic regions, service polar research stations and provide communications between fur factories. In the second Five-Year Plan, the Party and government assigned responsible tasks: mastering all parts of the North Sea path from Arkhangel'sk to Vladivostok and developing the productive forces of the North.

The polar fliers, who had accumulated experience from flights in the Arctic,/422 made a number of brilliant flights, to the glory of our motherland. In 1937, the polar pilots M. V. Vodop'yanov, V. S. Molokov, A. D. Alekseyev, I. P. Mazuruk, P. G. Golovin, M. S. Babushkin carried out the assignment of the government to found stations on the drifting ice in the region of the North Pole, in an exemplary manner.

Polar aviation lines became the basic means of communication in the North. In 1933, on these lines, 180 passengers and 14.7 tons of mail and cargo were carried, but in 1940, 11,867 passengers and 937 tons of mail and cargo were carried. The total volume of transportation in this period grew from 35.4 thousand to 1,542 ton kilometers[410].

On 17 March 1933, a special combined M. Gor'kiy agitation squadron was formed for servicing important political and economic campaigns conducted by the Communist Party and the Soviet government: the popularization of the aerializing of the nation, agitation for the establishment of local aviation, and the conduct of mass cultural-instruction work. In the first five years of existence of the M. Gor'giy agitation squadron, various measures were taken involving more than ten million people. As an incentive, flights on agitation

P. G. Golovin

aircraft were awarded to more than 76,000 of the best laborers in industry, transport and agriculture.

The Party and government systematically noted the successes in peaceful labor of the workers of civil aviation. On Air Fleet Day in the USSR (1940), among the personnel of the Civil Air Fleet there were five Heroes of the Soviet Union, 187 workers decorated with orders and medals, 906 designated as "Outstanding members of the aerofleet", 1,625 awarded honorary certificates from Aeroflot, 20 with badges for one million kilometers of flight and 188 with badges for 500,000 kilometers.

In the pre-war years, much was done for the development of the Civil Air Fleet by the Chief of the Central Administration I. S. Unshlikht, I. F. Tkachev and V. S. Molokov, the deputy chiefs of the Central Administration Ya. Ya. Anvel't, N. S. Berezin, I. S. Semenov, the chiefs of departments and territorial administrations I. R. Groza, F. N. Gvozdev, A. Ye. Golovanov, I. F. Milovidov, A. G. Romanov, Sh. L. Chankotadze and others.

Using their great experience, a group of pilots of the Civil Air Fleet skillfully carried out combat missions in the winter of 1939/40, in the period of the Soviet Finnish War. Flying under conditions of heavy frost and bad weather, frequently under the fire of the enemy, the pilots of the Civil Air Fleet from 10 December 1939 to 20 March 1940, transported by air 33,845 people, including 21,166 wounded, and 2,664 tons of cargo [411]. The Soviet government /423 highly appreciated their activities, awarding the designation Hero of the Soviet Union to pilot A. N. Yakovlev and decorating many aviation workers with orders and medals.

Thus, in the years of the pre-war Five-Year Plans, thanks to the advantages of the socialist system, the concern of the Communist Party and the Soviet government and the help of Soviet society in founding the industrialization of the nation, the Civil Air Fleet was strengthened and began to play a great role in the development of the national economy. According to the most important indicators, it became first in the world. The Civil Air Fleet grew and educated numerous cadres of aviation workers, who showed themselves to be highly knowledgeable, experienced, daring and brave patriots.

In the War Years

The treacherous attack of fascist Germany on the Soviet Union forced civil aviation beyond its ordinary peaceful work. The appeal of the Communist Party to the people with a call to rise to the defense of the motherland called forth a great patriotic up-welling among the personnel of civil aviation.

At numerous meetings conducted in the sub-units, the pilots, technicians and junior specialists expressed their readiness together with the entire Soviet people, to struggle with the enemy.

On the second day of the war, 23 June, the Council of Peoples' Commissars of the USSR subordinated the Civil Air Fleet in an operational sense to the Peoples' Commissariat of Defense, ordering the mobilization of all employees and workers in the Civil Air Fleet in confirming the position about the work of the Civil Air Fleet in wartime. The Central Administration of the Civil Air Fleet was given tasks of organizing basic aviation groups and detachments of civil aviation for the Red Army, performing special transportation for the Peoples' Commissariat of Defense, the Peoples' Commissariat of the Military Naval Fleet, the Peoples' Commissariat of Internal Affairs and the Peoples' Commissariat of Communications, servicing the special requirements of the national economy and preparing cadres. According to the position on the work of the Civil Air Fleet in wartime, on 25 June 1941, chast's of civil aviation were formed, which were sent to the front. In Moscow, the Moscow aviation group of the Civil Air Fleet was established, with the special purpose of carrying out special missions for the Red Army Command.[412]

Appointed commanders of front chast's of the Civil Air Fleet were A. P. Zolotov, S. S. Zapylenov, I. Ye. Segedin, P. S. Rasskazov, A. I. Podsosov, I. V. Sulimov, A. A. Lavrent'yev, N. A. Oprishko, Ye. T. Klusson, V. M. Trutayev, Sh. L. Chankotadze, G. S. Chachanidze and others. /424

In their report to the Central Committee of the All-Union Communist Party (bolshevik) and the Council of Peoples' Commissars of the USSR on the readiness of the newly formed chast's of the Civil Air Fleet to carry out combat missions, the chief of the Central Administration of the Civil Air Fleet, Major General of Aviation V. S. Molokov, and the chief of the Political Administration, Brigade Commissar I. S. Semenov wrote, "The political state of the personnel of the Civil Air Fleet is high. The pilots, technicians, commanders and political workers burn with a desire to be more quickly included in combat work for the destruction of the enemy. This is indicated by the exceptional striving by each workers of the special podrazdeleniyes of the Civil Air Fleet to receive a combat mission and fulfill it with honor."[413]

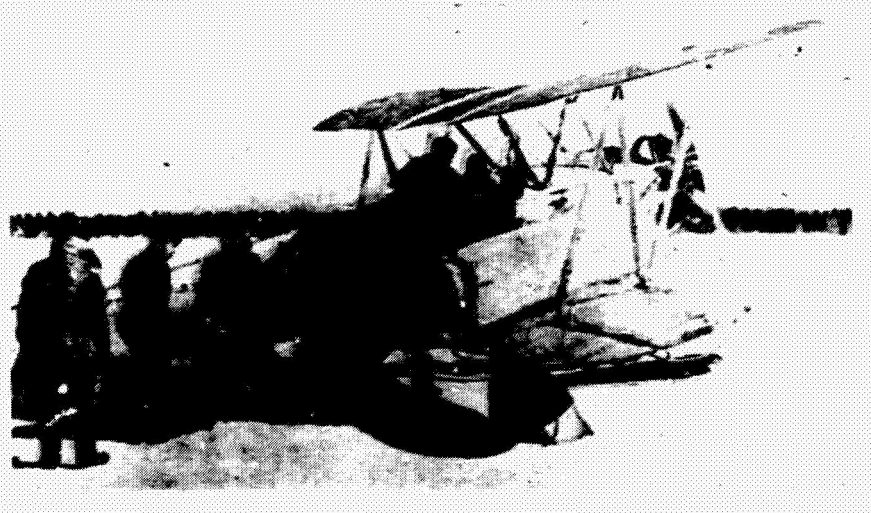
Political sections were set up in the newly formed special aviation groups of the Civil Air Fleet, and from August 1941, commissars of aviation groups and squadrons were designated. The political organs, political workers and Party organizations of the podrazdeleniyes played an important role in developing high morale and combat spirit in the personnel.

The front chast's of the Civil Air Fleet carried out the following basic missions: transporting ammunition, arms and fuel and oil for ground troops and front aviation; supplying communication for the staffs of fronts and air armies with the ground troops and chast's of combat aviation; participating in dropping and landing airborne troops; evacuating wounded from the frontal zones to the rear and supplying medicine and preserved blood to the forward hospitals; supporting the combat activities of partisans, supplying them with ammunition, medicine and supplies and removing wounded; conducting aerial

reconnaissance and periodic bombing of the enemy on the field of battle and in the close rear at night; dropping leaflets. The front chast's of the Civil Air Fleet took active part in the heroic defense of Moscow, Leningrad, Kiev, Odessa, Sevastopol' and Stalingrad.

When Leningrad was blockaded, the only means of communication with the beseiged city was aviation. At the beginning of October 1941, by a decision of the State Defense Committee, the Civil Air Fleet was given an exceptionally large and responsible task, to supply Leningrad daily with hundreds of tons of food, arms and ammunition, and to remove qualified workers and specialists in the defense industries from Leningrad. The performance of this mission was assigned to the Moscow special purpose aviation group, commanded by V. M. Korotkov, with I. M. Karpenko as commissar. The best trained and most experienced crews from the aviation group were assigned for this task.

Thanks to the high activity and initiative of the flight personnel, the /425
assignment of the State Defense Committee to transport various urgent and important cargoes was not only fulfilled, but exceeded. In two and a half months, from 10 October to 25 December 1941, ammunition, arms and supplies amounting to 6,233.9 tons were supplied to Leningrad. Fifty thousand people were taken out of the city, including about 30,000 workers and specialists in the defense industry and 13,208 wounded [414]. The Military Council of the Leningrad front greatly appreciated the work of the Moscow special purpose aviation group, and presented government awards to a large group of pilots.



Evacuation of Wounded to the Rear. 1942.

Giving great help to Leningrad in carrying out its heroic defense, the pilots of the Civil Air Fleet had to fly across the front line, under conditions of constant fire on our aircraft by German antiaircraft artillery and fighters. However, our crews did not cease to fly either day or night.

During one of such flights on the Volkhovsk front, the commander of the Li-2 aircraft, communist A. I. Semenkov was severely wounded. Having lost much blood, and at times losing consciousness, he continued to guide the

aircraft for 40 minutes and found the strength and courage within himself to land the aircraft at the airfield.

During the defense of Odessa, high combat activity was demonstrated by the personnel of the independent aviation detachment of Po-2 aircraft (commander V. A. Sedlyarevich). When the enemy artillery began to shell the city with /426
heavy guns, the Civil Air Fleet detachment was given the mission of finding the enemy fire positions from the air and informing the command of the defense region of their location.

Komsomol P. S. Bevz particularly distinguished himself in carrying out this mission. Showing bravery, daring and persistence, he flew 10 to 12 hours a day under the most difficult conditions.

Flying on a regular reconnaissance flight on the night of 3 September 1941, Bevz with the permission of the commander. took on board the aircraft several aviation bombs and dropped them on enemy artillery batteries. These were the first bombs, thrown by hand from a peaceful Po-2 aircraft on German troops. In the future, the Po-2 aircraft began to be utilized as a light night bomber.

After carrying out one of his combat missions, Bevz wrote a request to be taken into the ranks of the Communist Party. He took an oath to devote all his strength and life to the struggle with the enemy until his complete annihilation. On 13 September, P. S. Bevz perished carrying out a combat mission. The daring pilot was posthumously awarded the Order of the Red Banner.

At the beginning of October 1941, the Moscow special purpose aviation group of the Civil Air Fleet was assigned to transport the Fifth Airborne Corps from Teykov to the Orel area.

From 3 to 5 October, the group made 216 aircraft flights, transporting 5,440 warriors and officers and 12.5 tons of ammunition to near Orel [415]. The movement of the Fifth Airborne Corps was carried out in one day less than the time established by the Supreme High Command.

Altogether from October 1941 to January 1942, the chast's of the Civil Air Fleet which took direct part in the struggle for Moscow made 32,730 flights, including 845 in the enemy rear, transported 49,822 soldiers and 1,365 tons of ammunition, arms, medicine and supplies [416].

In January-February 1942, during the advance of Soviet troops, the aircraft of the Moscow group carried out important combat tasks in landing the Fourth Airborne Corps and supplying troops and ammunition to the First Guards Cavalry Corps, operating in the enemy rear. Under difficult conditions, about 12,000 soldiers and officers and 1,700 tons of ammunition and supplies were transported in two months to the region of Vyaz'ma and Dorogobuzh [417].

In June of 1942, in order to help the defenders of Sevastopol it was necessary to urgently deliver ammunition and supplies. The performance of /427
this mission was also assigned to the pilots of the Moscow aviation group. The flights to Sevastopol and return were made over the sea. The aircraft

landed at night under complex conditions at the only airport remaining to the defenders of Sevastopol, the Khersones lighthouse. The airfield was systematically subjected to severe bombing from the air and intense artillery fire by the enemy. The crews carried out the assignment with great effort, giving examples of piloting mastery, bravery and heroism.

From 21 June to 1 July 1942, the pilots of the aviation group made 229 night flights with cargoes for Sevastopol, bringing the defenders of the city 218.2 tons of ammunition and supplies, and removing 2,162 people from the city, including 1,542 wounded warriors and officers, and 1.7 tons of the most valuable cargo [418].

Air transport had great significance in the battle of Stalingrad. In the tense moment of the preparation for the counterattack, the Volga began to be covered with ice, and the transport of ammunition by water was hampered. During this period, the pilots of the Civil Air Fleet regularly made flights, supplying the troops in the front positions with bullets and shells.

The order of the Eighth Air Army for 17 December 1942 gave high recognition to the activities of the Seventh Special Aviation Regiment of the Civil Air Fleet. "When ice was forming on the Volga River," the order read, "difficulties arose in supplying ammunition, fuel and lubricants and aviation technical goods to the airfield on the right bank of the Volga, since the crossings were not in condition to support transport. This created the threat of a break in the normal operation of our aviation. To get out of the position created, the crews of the Civil Air Fleet were given the mission of transporting ammunition and fuel and lubricants by aircraft. In this work from 12 to 16 December 1942, examples of strenuous work were given by the crews of the ships of Major Chernyakov, and Captains Riz, Katsitadze and Rasshchupkin. By their self-sacrificing work in supplying combat support they facilitated the successful combat work of our aviation chast's based on airfields on the right bank of the Volga River". Gratitude was expressed to all personnel of the aircraft crews.

In December of 1942, when our mobile group was sent against Hoth's group, attempting to break through from Kotel'nikov to the fascist troops surrounded at Stalingrad, significant help was given to the tankers by the pilots of the Civil Air Fleet. Impetuously moving along the Volga wall, the Soviet tankers left their supply bases far behind. A blizzard closed the roads, and tank /428
with fuel could not get through. The tanks were without fuel and were forced to stop.

The chast's of the Civil Air Fleet were given the mission of urgently supplying fuel to the points where our tank aggregations were located. The Li-2 aircraft of long-range aviation cooperated with the aircraft of the Civil Air Fleet in carrying out this mission. In spite of the complexity of the meteorological conditions, the Civil Air Fleet crews quickly supplied the fuel. The tankers were able to destroy the enemy on the river Myshkova by decisive blows.

In the battle of Stalingrad from August 1942 to Feburary of 1943, the aircraft of the Civil Air Fleet made 46,000 aircraft flights, transported more than 30,000 people and supplied urgent military cargoes of 2,587 tons. The combat activities of the aviation chast's of the Civil Air Fleet were highly appreciated by the Supreme High Command and the commands of the fronts. Hundreds of pilots, technicians and engineers were decorated with orders and medals, and the Seventh Independent Aviation Regiment of the Civil Air Fleet was made the 87th Guards Regiment of the Civil Air Fleet.

In the battle for Kursk, combat assignments were outstandingly carried out by the Eighth, 14th and 98th Independent Aviation Regiments of the Civil Air Fleet, and the First Aviation Division and 62nd Independent Guards Aviation Regiment of the Civil Air Fleet. In the battle of Kursk and the operations to liberate the left bank area of the Ukraine, they made 80,181 flights, transporting 62,331 people, including 21,077 wounded [419].

In 1943, the chast's of the Civil Air Fleet in the frontal areas transported 351,674 people and made 466,035 aircraft flights [420].

The experience of flights at low altitudes and the improvement of tactics as a function of the combat situation led to a significant reduction in aircraft losses. The number of flights per irreplaceably lost aircraft were: in 1941 -- 246, in 1942 -- 627, in 1943 -- 2,035 [421].

All the front chast's of the Civil Air Fleet took active part in the advancing operations of 1944 and 1945.

The advancing operations of Soviet troops to liberate the right bank area of the Ukraine took place under conditions of the spring muddy season and loss of roads, and the tank units experienced a sharp need of ammunition and fuel. The aviation regiments of the Civil Air Fleet were given the mission of supplying the advancing mobile troops by air and providing the rebasing of personnel of air army chast's to forward airfields.

In February 1944, the 26th Aviation Regiment of the Civil Air Fleet supplied chast's of the Eighth Guards Army with ammunition and tank fuel for 13 days. In the second half of February 1944, this same regiment provided the rebasing of the first mixed aviation corps to forward airfields. /429

For successful performance of missions, by an order of the Peoples' Commissar of Defense, aviation regiments were given honorary designations: the 26th was the Krivoi Rog, and the 44th was the Uman'.

In the operations to liberate the Crimea, aviation units of the Civil Air Fleet made 19,543 flights and transported 21,848 people. For successful fulfillment of the mission assigned by the command, the Second Aviation Regiment of the Tenth Guards Aviation Transport Division was given the honorary designation of Sevastopol.

During the liberation of Belorussia, aviation units of the Civil Air Fleet provided transportation for ammunition, arms and fuel to the advancing

units, and also to partisans in the enemy rear. All front chast's of the Civil Air Fleet took part in the operations of the Red Army to liberate Rumania, Bulgaria, Czechoslovakia, Hungary, Yugoslavia and Poland.

In the Berlin operation, the 23rd and 62nd Guards Aviation Regiments of the Civil Air Fleet and the Tenth Guards Aviation Transport Division took part.

Altogether, during the Second World War, units of the Civil Air Fleet made 1,595,943 flights, 83,782 of them at night; transported 1,538,982 people, including 66,673 to or from the enemy rear and dropped 44,876 people by parachute in the enemy rear [422]. 122,027 tons of cargo were transported by the front chast's, including 24,998 tons of ammunition, 76,659 tons of arms and supplies, 1,698 tons of medicine, 2,044 tons of preserved blood and 15,782 tons of mail [423].

In the combat activities of front chast's of the Civil Air Fleet, a very important place was occupied by flights of air crews in the enemy rear to the partisans. The aviation regiments of the Civil Air Fleet received accurately daily information from the staffs of the partisan movement about the requirements for aircraft and the quantity and nature of cargo to be dropped, and also reports about the readiness of landing fields. To identify landing fields, arbitrary light signals were set up for each night.

Each regiment of the Civil Air Fleet had, as a rule, its representatives with the partisans, who organized the arrival and departure of aircraft and supervised the work of seeking and preparing landing fields. The forces of the partisans and local population in the enemy rear made the landing fields on which the transport aircraft landed and took off. In 1942, direct radio communication was set up between the aviation regiments and the partisan brigades.

In helping the partisans, perseverance, bravery and high mastery were /430
demonstrated by pilot G. A. Taran. The name of A. P. Mamkin will live eternally among the heroes. Flier communist Mamkin made 70 night flights to the enemy rear. He supplied the peoples of the area with 20 tons of ammunition and removed 280 severely wounded partisans to the mainland.

Joining the Party in 1940, A. P. Mamkin wrote in his application, "I wish to be in the ranks of Lenin's Party and bind myself to devote all my knowledge, strength and, if necessary, my life itself to the affairs of our glorious Communist Party." And he honorably fulfilled his oath to the motherland.

On the night of 11 April 1944, Aleksandr Mamkin returned from a regular trip with 13 partisan children on board. In passing over the front line, Mamkin's aircraft was hit and caught fire. The pilot was severely wounded. The fire began to spread rapidly through the pilot's cabin. Stinging smoke covered the instrument panel and burned the eyes. The pilot's coverall caught fire, blood oozed from the wounds on his head, his burned back and shoulders hurt intolerably. Mamkin had a parachute, and he could have saved his own life. But there were children on board the aircraft, and the pilot carried out his citizen's duty, continuing his heroic flight. Losing blood, Mamkin

G. A. Taran

P. F. Yeromasov

nevertheless brought his aircraft to the location of our units and made a safe landing. And his first concern on the ground was to save the children in the burning aircraft. In a coverall covered with flames, deeply wounded, he set first to removing the children from the airplane. The children were saved at the cost of the heroic flier's life[424].

Civil aviation provided great help to the partisans of Czechoslovakia, Yugoslavia, Poland and other nations of eastern Europe.

In 1944, a podrazdeleniye of transport aircraft was sent to the Bari airfield in Italy./431 It was intended for flights to the Yugloslavian partisans. One of the experienced pilots, Hero of the Soviet Union P. F. Yeromasov, was designated commander of the podrazdeleniye. Under complex combat and meteorological conditions, the crews honorably fulfilled their combat assignment of supplying the partisans with ammunition, armament, food and medicine, and in removing wounded to territory liberated from fascist troops. Ship commanders D. S. Yezerskii, P. M. Mikhaylov, V. F. Pavlov and V. A. Shipilov were designed Hero of the Soviet Union.

The crew of a Li-2, ship commander A. S. Shornikov, copilot B. T. Kalinkin and navigator P. Ya. Yakimov, under difficult conditions, removed from enemy encirclement the staff of the Yugoslavian Peoples' Liberation Army and the members of the police bureau of the Communist Party of Yugoslavia headed by Iosip Broz Tito. For heroism and bravery, the Presidium of the Supreme Soviet of the USSR designed the commander, navigator and copilot of the ship as Heroes of the Soviet Union, and the Soviet government made them Peoples' Heroes of Yugoslavia.

In the front units of the Civil Air Fleet, great attention was constantly given to Party political work, which was called upon to develop in the aviators a love for the motherland, devotion to the Party and people and high morale combat qualities.

Such a theme as "Defense of the motherland is a holy obligation of each citizen of the Soviet Union" was the chief theme of Party and komsomol meetings,

and of any discussion or report. The political sections used all forms and methods of mass political work, mobilizing the personnel to carry out the combat missions assigned to the chast' or podrazdeleniye.

The rear area podrazdeleniyes of the Civil Air Fleet had the mission of preparing pilot cadres for combat aviation and for front chast's of the Civil Air Fleet. This work was developed even before the start of the war, and with /432
the start of the war it grew even more. From 1941 to 1945, a total of 40,046 men were trained as flight technical personnel, including 31,000 pilots. Of these 22,336 were sent to front line and long-range aviation, including 20,500 pilots.

In addition, the rear podrazdeleniyes of the Civil Air Fleet were drawn into aircraft transfer. In August of 1941, an aviation group of the Civil Air Fleet was formed to transfer Il-4 airplanes from the Far East to the West, whose pilots transferred hundreds of aircraft in a short time.

In 1941 and 1942, a great work was done in constructing the air route Moscow -- Grasnoyarsk -- Uel'kal', set up by a decision of the State Defense Committee of the USSR on 9 October 1941 to transfer aircraft. The chief of this route was General I. S. Semenov. To work on it, the First Transfer Aviation Division was formed on 15 July 1943, commanded by Hero of the Soviet Union Colonel I. P. Mazuruk.

During the Second World War, at the front and in the rear, 2,358 thousand people, and cargoes and mail totalling 278,000 tons were transferred, primarily for the front. The total flight for all front chast's and rear podrazdeleniyes was over 4.5 million hours.

The personnel of the Civil Air Fleet worked with great effort during the years of the war. The chast's and podrazdeleniyes of civil aviation took active part in destroying fascist Germany and imperialist Japan. Nine of the best chast's were decorated with orders. For successfully fulfilling combat missions, over 12,000 pilots, commanders, political workers, engineers and technicians were decorated with orders and medals, and 15 pilots were designated Hero of the Soviet Union.

Civil Aviation in the Post-War Period

After the victorious conclusion of the Second World War, enriched by combat experience and inspired by the historical victories of the Soviet people, politically and morally matured and strengthened pilots, engineers and all workers in civil aviation returned to peaceful labor. The restoration of airlines, airports and territorial administrations and the organization of air transportation in all the liberated republics, regions and districts, were the most important tasks of the Civil Air Fleet.

The Party and government demonstrated great concern about the technical equipment of the Civil Air Fleet. There were rapid steps to improve the ground /433
equipment of airports, radio communications and the aircraft-motor stock. Civil aviation began to receive more aviation technology, improved and more

efficient in comparison with the pre-war years. In the law of the Five-Year Plan for the restoration and development of the national economy of the USSR in 1946-1950, an enormous program of development for civil aviation was planned. "On air transport: increase the stock of aircraft for civil aviation transport with contemporary passenger and transport aircraft, extend the network of airlines to 175,000 kilometers. Restore and develop air communications, first in the most important directions, connecting Moscow with the centers of the United Republics and the city areas, and also aerial communications of the northern, Siberian and Far Eastern regions. Restore and develop local airlines, connecting the centers of the union and autonomous republics with outlying regions.

"Equip the airlines of union significance with technical means which will permit them to make regular flights throughout the year and night flights on the important trunk lines. Restore 16 airports for use by contemporary heavy and high speed transport aircraft. Restore and construct 20 air terminals in existing and newly constructed airports.

"Develop mass utilization of special purpose aviation in the struggle with pests in agriculture and forestry, for the medical service of the population, and also for aerial photography"[425].

In accordance with this law, the volume of work by the Civil Air Fleet grew at a rapid tempo. Il-12 and Il-14 aircraft designed by Hero of the Soviet Union S. V. Il'yushin and An-2 aircraft designed by O. K. Antonov began to arrive for wide use in civil aviation.

The Iliad of outstanding pilots in civil aviation in the post-war period was led by Heroes of the Soviet Union G. A. Taran, D. S. Yezerskiy, P. F. Yeromasov, B. T. Kalinkin, P. M. Mikhaylov, V. F. Pavlov, S. A. Frolovskiy, V. A. Shipilov, A. S. Shornikov, I. I. Ryshkov. Thousands of pilots, navigators, air mechanics, air radiomen, engineers, mechanics, technicians, workers and employees of civil aviation, decorated for their combat services with orders and medals, developed socialist competition for the successful development of a network of airlines and the growing utilization of aviation in various branches of the national economy of the USSR. /434

The personnel of the podrazdeleniyes, successfully handling the organization of flight service, carried out a great and strenuous work to restore airfield installations, service buildings, repair enterprises, warehouses, radio stations, living quarters and other objects. Thanks to the active participation of all personnel and the assistance of local Party and Soviet organizations, great work was carried out in restoring the airlines of all the liberated territories.

In the first years of the post-war Five-Year Plan, tens of buildings and installations were put into service in the airports of Kiev, Minsk, Khar'kov, Voronezh, Odessa, L'vov, Riga, Leningrad, Rostov, Krasnodar, Mineral'nye Vody, Vil'nyus, Simferopol' and others. In growth of the network of airlines, the plan for significantly overfulfilled. The technical base of aviation was strengthened. Aviation repair enterprises and a network of

receiving and transmitting radio centers were restored, a dense net of local airlines, connecting the centers of union and autonomous republics, and the district and area cities with outlying regions was restored and newly constructed. In the North, in Siberia, in Yakutiya, and the regions of Central Asia and in the Far East, air communication developed greatly. In 1948, regular delivery of passengers and mail in one to two days on the longest trunk line Moscow -- Khabarovsk, was organized, over a distance of about 7,000 kilometers.

In the last year of the Five-Year Plan, nine million passengers, 31,000 tons of mail and 151,000 tons of cargo were transported. There was a significant increase in the length of airlines in the USSR. The application of aircraft and helicopters in agriculture and forestry, for aerial photography and geological reconnaissance, for the sea animal industry and other work in the national economy developed widely.

The 19th Congress of the Communist Party of the Soviet Union, which took place in October of 1952, demanded in its directives, "A significant increase in the stock of transport aircraft for the Civil Air Fleet, and also a network of airlines and airports equipped for round the clock operation"[426].

It was also planned to develop and manufacture airport equipment to ensure flights under complex meteorological conditions. The planned volume of transport exceeded by almost two times the volume of transport in the last year of the fourth Five-Year Plan.

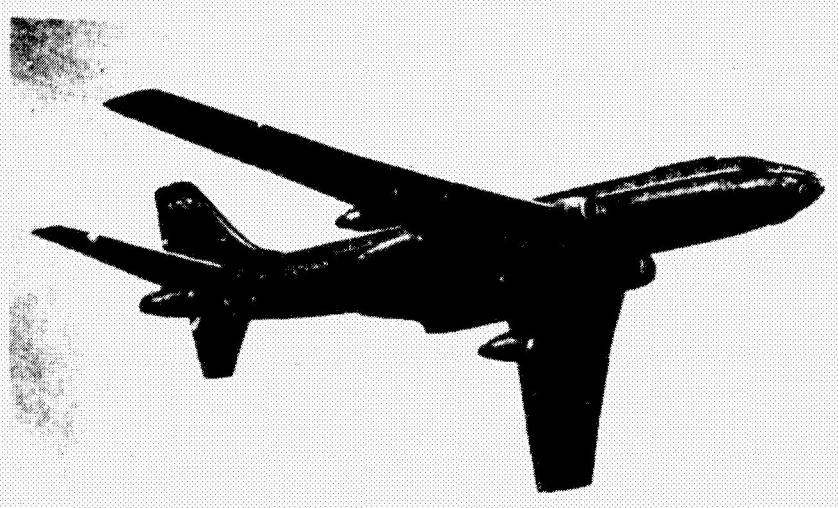
However, in this period it was noted that our transport aviation lagged /435
somewhat behind overseas transport aviation. The airlines of the western nations already had four motor passenger aircraft with pressurized cabins. At that time, the Design Bureaus of A. N. Tupolev and S. V. Il'yushin made experimental four-motor multi-place passenger aircraft with pressurized cabins, which were the equal of the aircraft of western countries in their flight technical characteristics, but they were not in series production, although they were undergoing the necessary tests. The majority of aircraft in use continued to be the two-motor Li-2, Il-12 and Il-14 aircraft. The release for series production of four-motor passenger aircraft with piston engines was dragged out over a prolonged period.

To overcome the noted lag behind foreign aviation technology and speed up progress in the area of developing our civil aviation, the Central Committee of the Communist Party of the Soviet Union and the Council of Ministers of the USSR adopted a resolution in 1953 on building the first multi-place passenger jet aircraft, the Tu-104, and after two years, on 17 June 1955, this aircraft made its first flight.

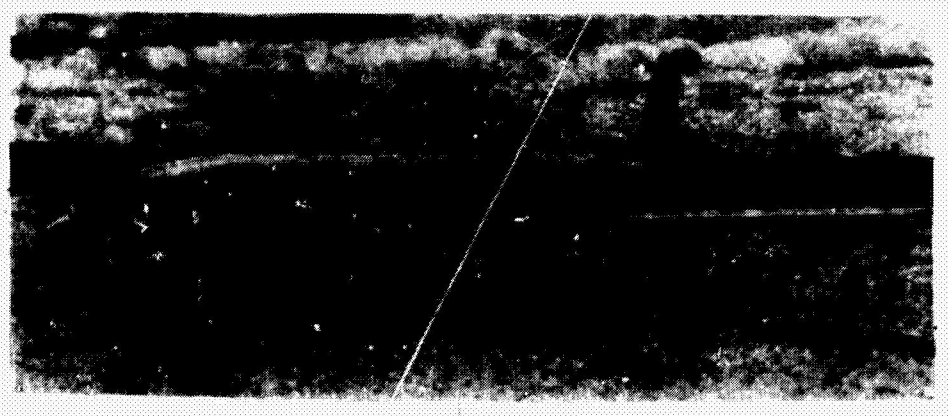
The appearance of high-speed multi-place jet passenger aircraft on the airlines of the USSR required great attention to questions of thoroughly preparing highly qualified cadres, equipping airlines and technically supplying airports.

Detailed planning preparation for the flight of passenger jet aircraft /436

began long before their appearance on the air routes. Even by 1954 on the eastern trunk lines, the transport of cargoes, mail and sailors had been organized on military jet aircraft. At this same time, there was a wide development of training for flight and technical cadres. Significant attention was paid to investigating the conditions of flight of jet aircraft at high altitudes.



Tu-104 in Flight.



The IL-18 Turboprop Passenger Aircraft.

The crews of passenger aircraft, who possessed the peaks of flight mastery, daily demonstrated and are demonstrating high patriotism, daring and resourcefulness. As an example of this, we can consider the heroic feat performed by air mechanic T. T. Romashkin on 8 January 1954 on a Li-2 aircraft.

On this day, the regular run aircraft was coming from Tallin to Leningrad with passengers on board. Among the passengers there were also two armed bandits, traitors to our motherland. When the aircraft was in the air, the criminals under threat of using arms demanded that the crew fly abroad. Scorning the deadly danger, air mechanic T. T. Romashkin threw his breast against

the pistols of the enemy. Shots were fired. Romashkin was severely wounded, but he continued the struggle. With the aid of ship commander I. M. Garanin, copilot A. A. Kalinychev and air radio man V. I. Gladkov, Romashkin disarmed and captured the bandits. But the daring aviator died of his wounds. For daring and bravery, T. T. Romashkin was posthumously awarded the designation Hero of the Soviet Union, and the other members of the crew were given the Order of the Red Banner.

Paying great attention to the development of air transport, the 20th Congress of the Communist Party, which took place in February of 1956, demanded /437
in its directives for the sixth Five-Year Plan on the development of the nation national economy of the USSR 1956-1960, "On air transport, during the Five-Year Plan, increase the cargo turnover by two times and the volume of passenger transport by approximately 3.8 times. Introduce high speed multi-place passenger aircraft on the air trunk lines. Reconstruct the major airports on the air trunk lines"[427].

Carring out these decisions, Soviet designers, pilots, engineers and technicians made and mastered new multi-place comfortable passenger turboprop aircraft following the Tu-104 aircraft.

The special 21st Congress of the Communist Party of the Soviet Union, which took place on 25 November 1959, determined that "As a result of the introduction of high-speed multi-place turbine and turboprop aircraft, air transport will become one of the primary means of passenger transport. The movement of passengers by air transport is to grow approximately six times during the Seven-Year Plan. To provide for the use of the newest types of heavy aircraft, it is planned to reconstruct and construct more than 90 airports, the airlines will be equipped with contempory means of aircraft guidance, and the network of airports for local airlines will be widened."[428]

The most vigorous development of civil aviation in our nation began with the appearance of jet liners on the airlines. Regular flights with passengers on the first Tu-104 jet aircraft began on 15 September 1956.

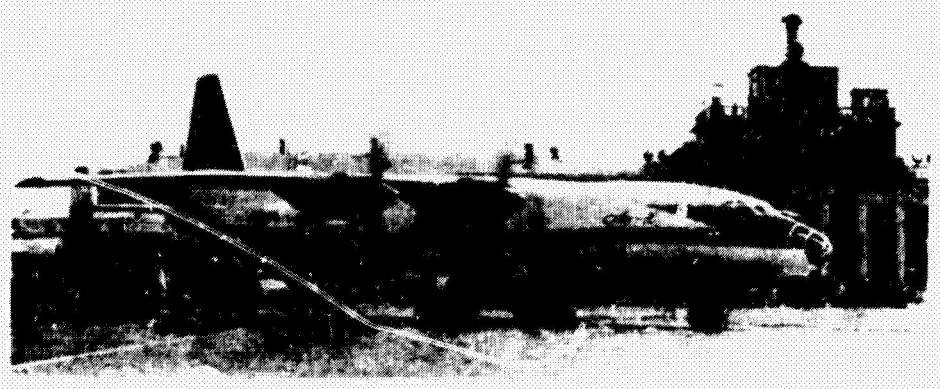
Successfully introducing the first passenger jet aircraft in the world, the Tu-104, into mass use, our nation overcame the lag in the area of civil aviation development and in two years outstripped the USA, England and other western nations in building passenger jet aircraft. The American aircraft Boeing 707 and the English aircraft Comet-4 appeared on the airlines only at the end of 1958, and the French aircraft Caravelle, in 1959.

After the first Tu-104 jet aircraft, there appeared the new air ships I1-18 and An-10 with four turboprop engines and 100 to 120 passenger spaces, and also the 170 place long-range trunk passenger aircraft, Tu-114. In 1959, at the world exposition in Paris of the International Aviation Federation, A. N. Tupolev was awarded the great gold medal as the designer of the Tu-104 and Tu-114. At the World Expedition in Brussels, the Tu-114 won the first /438
prize, the "Gran-prix".

After five years, that is at the end of 1961, the Tu-104 jet aircraft had

already made flights on 13 international and 40 domestic airlines. At this time, aircraft with gas turbine engines were operating on the main trunk aviation lines in our nation. They carried 55% of the total air passengers.

On the shorter airlines, the new Tu-124 and An-24 aircraft with gas turbine engines began to be used, whose appearance finished the first stage of reequipping civil aviation in our nation with high-speed multi-place aircraft.



The An-10 Taxies out to the Takeoff Strip.

The directors of civil aviation in this period were great aviation specialists: Marshal of Aviation F. A. Astakhov, Lieutenant General of Aviation Hero of the Soviet Union G. F. Baydukov, Marshal of Aviation S. F. Zhavoronkov. Under their direction in the period of peaceful construction, the workers of civil aviation toiled tirelessly to restore the airports and develop air transport.

In recent years, civil aviation has developed according to new assignments set up by the 22nd Congress of the Communist Party of the Soviet Union. In the program of the Communist Party of the Soviet Union adopted at this congress, it states, "Aviation transport must be converted to a mass form of passenger transport and cover all regions of the nation.

"Future rapid development will receive the newest jet technology, first /439
of all in the area of air transport, and also for the mastery of cosmic space" [429].

And already in 1965, aircraft with gas turbine engines made regular flights to all capitals of union republics, and important political and administrative centers of the nation. On the local airlines, they transported passengers between 3,000 populated points. The percentage of transport on jet aircraft grew to 78% by the end of 1965.

In 1965, the length of airlines grew to 0.5 million kilometers. The network of international air communications received great development. In 1964, the Soviet Union had agreements on air communications with 41 states.

The jet technology of the Soviet Union had earned the authority and trust of citizens not only of our nation, but of foreign countries. Soviet aircraft and helicopters have been acquired by many nations of Europe, Asia, Africa and even America. More than 30 nations use Il-18, Tu-104, Tu-124 and An-24 aircraft, and Mi-1, Mi-4 and Mi-6 helicopters purchased in our nation.

The colossal successes in the development of civil aviation are the result of the communist attitude of the Soviet people to their labor, and the enormous achievements of scientists, designers, specialists and workers in the aviation industry, the builders of aircraft.

The mastery of jet aviation technology was the clearest possible reflection of the outstanding preparation and high culture of flight and technical personnel, the rich practical experience, patriotism and high political consciousness of all workers in civil aviation.

Of the noteworthy Iliad of toilers in aviation, among the first to master the new jet and turboprop technology were pilots K. P. Sapelkin, G. D. Kuznetsov, L. N. Yegorov, A. P. Bystritskiy, P. I. Devyatov, V. A. Filonov, B. A. Anopov, B. P. Bugayev, S. D. Metelkin, I. V. Orlovets, N. A. Usanov, Kh. N. Tskhavrebov, N. M. Shapkin, A. Ya. Epp, V. Ya. Filimonov, N. V. Kaplya, M. I. Basov, N. I. Grunenyshev, A. N. Zakharevich, P. M. Mikhaylov, I. I. Boguslavskiy, L. M. Ulanova, the commander of an Il-18 ship, and the first woman to master turboprop aircraft.

In these years, the pilots of civil aviation are once again demonstrating high patriotism, courage and daring on the airlines of our nation.

The noteworthy qualities of a Soviet flier are displayed in the feat of a /440
pilot of the Armyanskoy independent aviation group, Edik Misanovich Bakhshinyan. On 10 September 1961, he daringly came to grips with three traitors to the motherland on board the Yak-12 aircraft he was piloting. The bandits tried by force of arms to compel the pilot to make a flight beyond the national borders. But neither the danger of death nor the severe knife wounds received by E. M. Bakhshinyan broke the will of the Soviet patriot. Bleeding, the pilot sharply turned the aircraft toward the airfield and put it into a steep dive. The enemies were disconcerted and were able to pick up their arms only after the aircraft had landed.

The criminals were captured. The pilot recovered from his severe injury and continued to work on the Transcaucasian airline.

On 29 September 1964, pilots Anatoliy Grigor'evich Shevelev and Vladimir Georgievich Bayde'skiy, making a flight on the An-2 aircraft from Kishinev to Izmail, entered an unequal struggle with criminals who demanded that the pilots fly abroad.

Using fire arms, the enemies were not able to force the crew to betray the motherland. Without sparing their own lives, the pilots broke up the plot of the enemies. In spite of severe wounds, they succeeded in landing the aircraft in a vineyard in the Kishinev region. One criminal was captured, a second killed.

Dusting Corn Plants with an Aircraft at the Gazyrskiy State Farm in the Krasnodar District. 1962.

For bravery and daring, E. M. Bakhshinyan, A. G. Shevelev and V. G. Baydetskiy were decorated with the Order of the Red Banner. /441

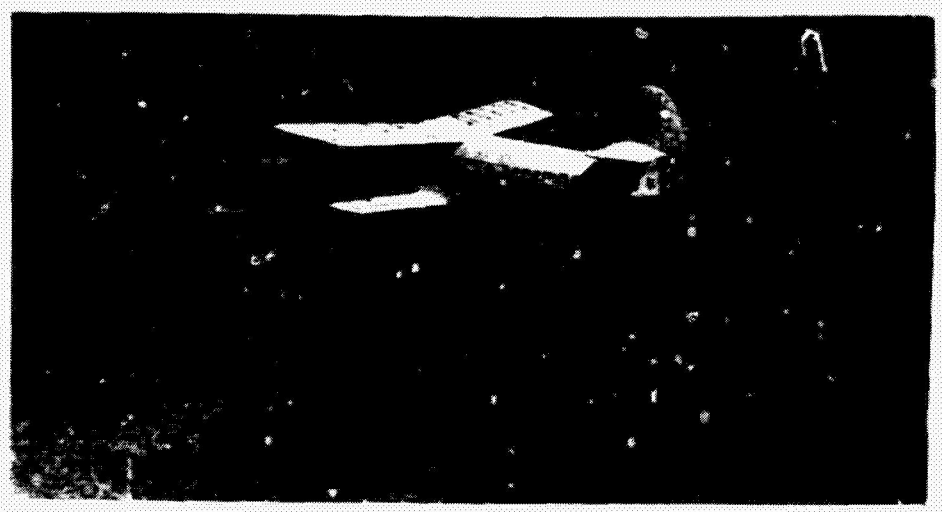
In August of 1966, pilot komsomols V. A. Shlenov and V. D. Tomashvili of the Sukhumskii airport distinguished themselves. With the aid of passengers, they subdued two armed bandits on board their aircraft.

The role and significance of special purpose aviation have grown from year to year in the post-war period. With the aid of aircraft and helicopters, aviation chemical work has been carried out in agriculture and forestry, in the struggle against weeds and pests in agriculture and forest culture and with the carriers of infectious illnesses, and leaf feeding plant fertilizers have been spread. From aircraft and helicopters, aerial photographs have been made and various types of searches, investigations, geological reconnaissance and support for the fish and sea animal industries have been carried out.

The successful development of special purpose aviation has been facilitated by equipping it with An-2 and Yak-12 aircraft, with Mi-1, Mi-4, Mi-6 and other helicopters. Our agricultural aviation has firmly occupied first place in the world both for the quantity of land worked and for the variations in the means applied. The growth of aviation chemical work in the post-war period took place at a rapid tempo. In 1946, only 0.8 million hectares were worked, but in 1966, 63 million hectares, which is almost a fourth of all the seeded area in the nation.

Polar aviation carried out great and valuable works in the mastery of the Arctic and the study of the Antarctic. From 1950 to 1966, 17 high latitude air expeditions "North" have been carried out using aircraft. The drift /442

stations SP-2 through SP-15 were first set up and then evacuated. From 1952, the first air expeditions in the northern regions of the eastern Arctic from the Chukotskc to Novoy Zemlya distributed first radio markers, and from 1956, drifting automatic radio meteorological stations, DARMS. Their application made it possible to widen the area of investigation of the Arctic Basin without high expenses.



Siberia. Cargo Aircraft over the Taiga. 1958.

The aircraft of polar aviation connect with the main body of the nation and among themselves, cities, collective farms and arctic settlements, performing ordinary work in supplying various cargoes, vegetables, fruits, supplies, mail, newspapers, magazines and movie films.

The investigation of the Antarctic is also to a significant degree carried out with the aid of aviation. In particular, polar aviation has come to play a great role in supplying people who spend the winter with cargo to the Antarctic. The first flight from Moscow to the Antarctic was made in 1962 on a Il-18 aircraft (ship commander A. S. Polyakov) and an An-12 aircraft (ship commander B. S. Osipov). The distance to the Antarctic and return exceeded 50,000 kilometers.

By an order of the Presidium of the Supreme Soviet of the USSR, pilots A. S. Polyakov and B. S. Osipov were awarded the high designation Hero of the Socialist Labor for outstandingly performing this flight. All the other members of the crews were given orders of the USSR. In November of 1963, a similar flight was made in two Il-18 aircraft.

In addition to carrying out research work, providing transportation and supplying cargoes to scientific stations, polar aviation makes ice reconnaissance and guides ships in all the frozen seas of the nation and in the central polar basin. Since 1959, helicopters based directly on the upper decks of icebreakers have begun to be widely used for this purpose. On the flag ship of

the [illegible] breaker fleet, the atomic ship Lenin, and on Leningrad class icebreakers, the helicopters are placed on special takeoff and landing platforms on the after-deck.

An important role is played by polar aviation in the development of productive forces in the north and north east of our nation. Transport of various cargoes by air is carried out on a wide scale for the oilmen of the Tyumen area, the gold workers of Yakutii and the Magadansk area and other northern regions.

The Civil Air Fleet faces new missions in the further development of air transport in our nation. /443

Our Design Bureaus and industry have reached the second stage of building new, even more improved types of passenger jet aircraft, which in their technical economic characteristics must surpass the best foreign models.

The number of such aircraft includes the long-range multi-place passenger jet aircraft Il-62 for 180 to 200 passengers and the giant Antey aircraft (An-22).

The workers of civil aviation make a colossal effort, not only to master and introduce jet aviation technology, but to spread the airfield network, open new airlines and provide well managed airports.

In many airports, high intensity lights have been set up to ensure the landing of aircraft in complex meteorological conditions. In 1963, on the 40th Anniversary of the founding of the Civil Air Fleet, the Central Committee of the Communist Party of the Soviet Union and the Soviet government highly evaluated the work of its personnel. For achievements in mastering aviation technology and serving the national economy, the Civil Air Fleet was given the Order of Lenin, and 750 workers of Aeroflot were given government decorations, the very best of them being designated Hero of Socialist Labor.

In August of 1966, for outstanding success in fulfilling the assignments of the Five-Year Plan for the movement of passengers by air transport, for application of aviation to the national economy and the mastery of new aviation technology, orders of the Soviet Union were awarded to the Moscow Transport Administration, Factory number 400, the Adler airport of the Northern Caucasus Administration, the Kiev Institute of Civil Aviation Engineers, the Kolpashev United Detachment, the Latvian Administration, the Makhachkalin United Detachment, the Myachkovskiy United Detachment and the Ukrainian Administration of Civil Aviation.

A large group of workers in civil aviation were awarded high government decorations.

More than 20 pilots, engineers and commanders of the Civil Air Fleet have become Heroes of Socialist Labor in the last six years, including B. A. Anopov, A. A. Bogomolov, I. I. Boguslavskiy, B. P. Bugayev, A. K. Vitkovskiy, L. P. Zlobin, G. I. Kalashnik, Yu. P. Konovalov, I. K. Kotsura, A. F. Kravets, S. D.

Kuzin, A. P. Kurmanchuk, P. N. Nikolayev, Ali Mamed-Nobi ogly Novruzov, A. P. Pomelov, I. Z. Samaladashvili, Z. F. Solomatina, N. G. Stepanov, L. M. Ulanova, I. T. Khokhlov and I. N. Sharov.

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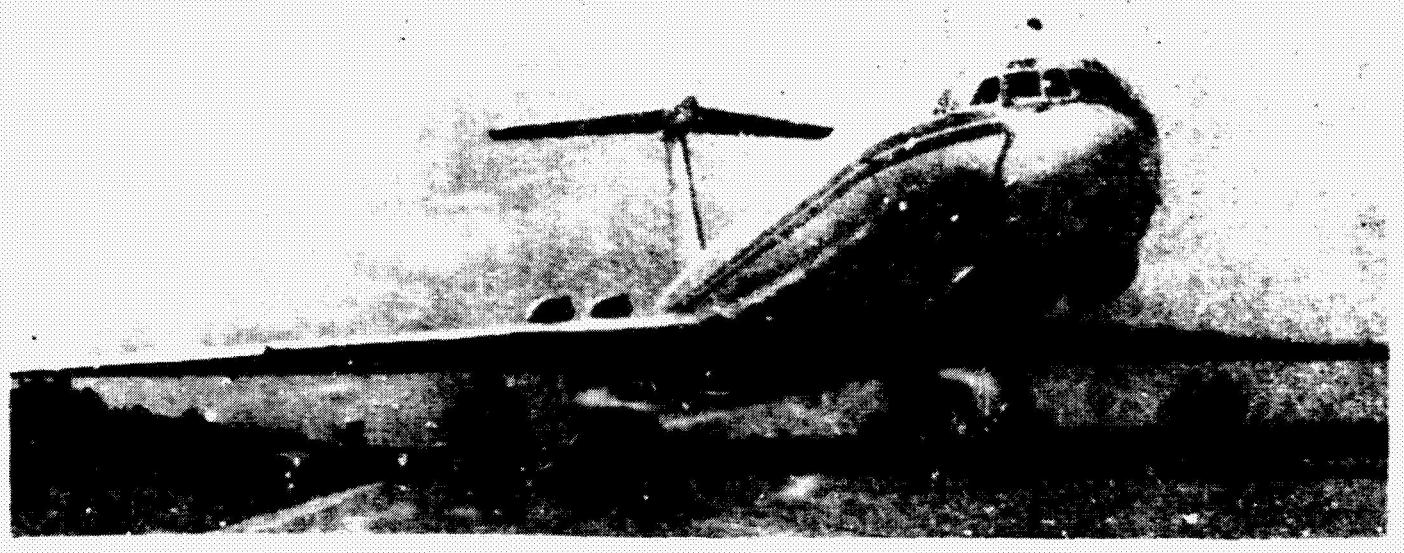


Il-62 at the Vnukovo Airport.

The honorary designations "Meritorious pilot of the USSR" and "Meritorious /445 navigator of the USSR" were received by tens of aviators.

The high appreciation of the Communist Party and Soviet government for the work of the civil aviation in mastering new aviation technology and carrying out the assignments of the Seven-Year Plan, inspired the entire collective of aviation workers to fulfill new tasks given to the air fleet.

The development of civil aviation proceeds by the further improvement of passenger service and high regularity of flights. In order to fly regularly, it is necessary to set up an organization for flight control which will make it completely possible to land aircraft under the most complex meteorological conditions. The introduction of such a system for the control of flights and turns on the landing field will be new progress in the development of the civil aviation of the USSR, which has become an enormous, sharply working conveyor, encircling our entire great nation from west to east and from north to south.

To ensure the further development of civil aviation and strengthen control of it, in July of 1964, the All-Union Ministry of Civil Aviation of the USSR

was formed on the basis of the Central Administration of the Civil Air Fleet in the Council of Ministers of the USSR. Ye. F. Loginov was designated Minister of Civil Aviation.

Majestic perspectives are opening for the development of mass tourist aviation. Magadan, Sakhalin Island, Chukotka and Kamchatka will become for us as close and attainable, as the cities of Mozhaysk, Borodino, Istra, Kalinin and Tula are for muskovites today; the nation will have no outskirts, no "bear corners". And all will be achieved thanks to aviation.

Full use will be made of the great advantage of civil aviation over all other means of transport, speed. In 1980, the area of operation of aviation will be increased five to seven times over that of 1964.

Aviation chemical work in agriculture and forestry will attain unprecedented dimensions. In 1975, the aviators will work 155 million hectares. This is more than half all the cultivated area of the nation.

The productivity of labor and aviation must grow about five times. The net cost of transport will be reduced significantly, and lower prices will be established. This will still further strengthen the stream of passengers and cargoes, and orders for all types of work by special purpose aviation.

The performance of the enormous missions assigned to civil aviation will be achieved thanks to accelerated, uninterrupted and thorough development of aviation technology and accelerated technical progress, which must give passengers more comfortable, rapid, completely reliable and highly economic flying apparatus. /446

The development of aviation is unthinkable without strengthened expansion of scientific research work, the development of new techniques for applying aviation to the national economy, the mastery of contemporary achievements in aviation technology and the introduction of aircraft with gas turbine engines, without a high technical culture in the nation and a high overall technological development of the national economy.

Numerous collectives of scientific workers in the State Scientific Research Institute, the State Planning and Investigation and Scientific Research Institutes for Civil Aviation, the Kiev and Riga Institutes and the higher aviation school of civil aviation conduct great and fruitful work in assuring further technological progress.

Thanks to the tireless concern of the Party and government, civil aviation has all that is necessary to carry out the missions assigned to it. The rapid tempo of its development and the multiplicity of its applications in the national economy indicate that in the Soviet Union aviation serves the interests of the people, the interests of communist construction.

In the directives of the 23rd Congress of the Communist Party of the Soviet Union on the Five-Year Plan for the development of the national economy of the

USSR in 1966-1970, the Civil Air Fleet was given new and responsible tasks for increasing movement by air transport, constructing airports on lines of union significance and on local lines, and equipping airports with systems of automatic and semi-automatic control of movements on the ground and contemporary means of radio technical equipment for controlling movements. During the years of the new Five-Year Plan, 35 to 40 airports will be constructed on main trunk aviation lines and about 200 airports will be constructed on local airlines.

In the near future, the airlines of the nation will see new jet airliners, the Tu-134, Il-62, and then the Tu-154 and the first supersonic passenger aircraft, the Tu-144.

Local airlines will receive the Yak-40 passenger aircraft and the V-2, V-8 and V-10 helicopters designed by M. L. Mil'. The stock of agricultural aviation and special aviation will be augmented by the An-2m aircraft, the KA-26 helicopter and others.

The time is not far off, when a hypersonic passenger aircraft will be built. After the construction of hypersonic passenger aircraft, comes the task of building passenger cosmic ships. /447

After a little more time has passed, it is not impossible for the present younger generation of civil aviation pilots to begin to be concerned with mastering the cosmos. This can be the future of civil aviation in the Soviet Union!

* * *

CHAPTER 10

SOVIET SPORT AVIATION

ABSTRACT. Soviet Sports Aviation, which was active by the time of the revolution, is described. Early leaders in the sport are named, their photographs presented, and exploits described. Sports Aviation, like all other phases of Soviet aviation, was drawn into the thick of the fighting in the second world war. The role of Sports Aviation in the conflict is described.

First Aviation Sportsmen /448

The first decade of the present century in Russia, as in many other nations, was marked by the birth of sport aviation. Its beginning was made by the efforts of enthusiasts, who from personal initiative, built flying apparatus at their own risk and expense, and frequently mastered the art of flying by themselves. The representatives of state power not only did not support their beginnings, but firmly, particularly in the beginning, opposed them.

However, the energy, persistence and desire of patriots to give their motherland wings helped the leading Russian people to overcome the barricades on their path to the sky. The pioneers in sport aviation after the air ship people were the glider men. The experimental flights of A. F. Mozhayskiy on a kite glider, the scientific works of the "Father of Russian Aviation" N. Ye. Zhukovskiy, who even at the end of the 19th Century had organized a group of glider experimenters, the works and investigations of N. A. Arendt, S. S. Nezhdanovskiy and other Russian scientists provided a firm foundation for the development of national glider studies.

In 1904, the Kievian G. P. Adler constructed a glider and tested it in flight. A few years later, K. K. Artseulov made flights on a glider of his own design. In 1909, B. I. Rossinskiy flew on a glider. From 1908 to 1912 A. V. Shiukov was occupied with designing gliders and flying on them. He made several successful flights from Makhatskiya mountain close to Tiflis on an apparatus he had constructed.

Gliders were built and flown by the now world famous aviation designer A. N. Tupolev, the outstanding pilot P. N. Nesterov and scientist S. A. Chaplygin and S. N. Y. 'yev. Early glider workers included also Professor

N. B. Delone, G. A. Vekshin, G. V. Alekhnovich, G. S. Tereverko, S. P. Dobrovol'skiy and many others. Gliders became the start of the path to aviation/449 for many designers and pilots whose glorious later works were written in the annals of aviation.

A. V. Shiukov

Aviation enthusiasts founded circles and clubs, which had as their purpose constructing flight apparatus and learning to fly, conducting sporting competitions, developing theoretical problems and propagandizing aviation. The founding of circles and clubs was caused also by the striving of the first Russian aviators to remove themselves from the oppression of individual private industrialist, who, speculating on the enormous interests of the public in aviation, acquired aircraft, hired pilots under slave labor agreements and arranged to suppress public flights.

In January of 1908, the All-Russian Air Club was opened in Petersburg. It quickly became a member of the International Aeronautical Federation (FAI). Aerial navigation circles, societies and clubs began their activities in Odessa, Saratov, Kiev, Chita, Simferopol, Rostov, Nizhnii Novgorod, Khar'kov and other cities.

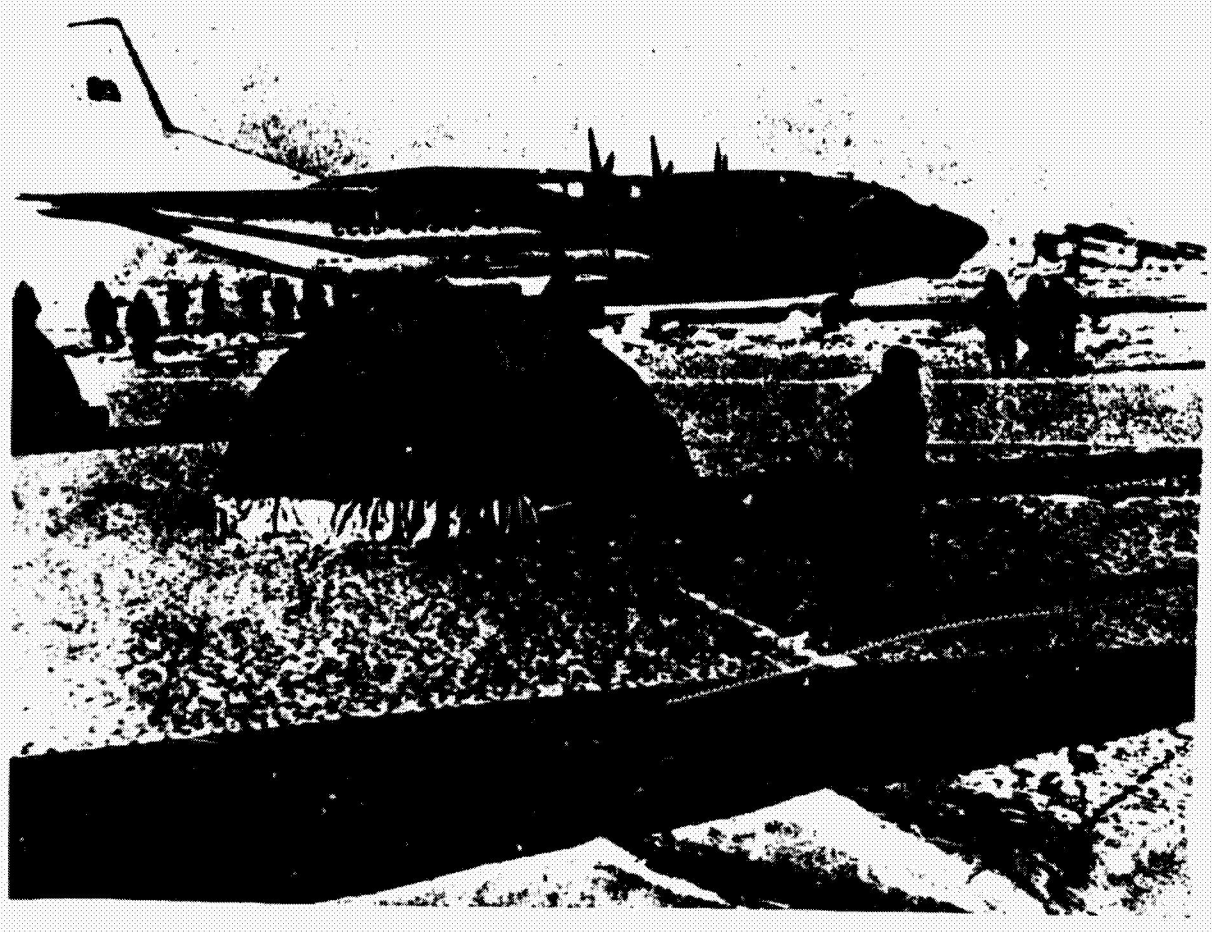
In Moscow, the Moscow Airships Society was founded on the initiative of N. Ye. Zhukovskiy. A great role in the development of national aviation and sport aviation was played by circles at the technical higher educational establishments, founded with the direct participation of N. Ye. Zhukovskiy, S. A. Chaplygin, N. B. Delone, K. P. Boklevskiy, N. A. Rynin and other scientists.

Aircraft flights by the first Russian pilots M. N. Yefimov, N. Ye. Popov, A. A. Vasil'yev, S. I. Utochkin, B. I. Rossinskiy, N. D. Kostin, B. V. Matyevich-Matseyevich, L. M. Matsiyevich, I. M. Zaikin, Ye. V. Rudnev and others attracted masses of watchers, and awoke in many the desire to involve their lives with aviation.

It should be noted, that the activities of the first pilots and social aviation organizations had a clearly visible sporting character. The very first years of the birth of sport aviation in Russia were marked by many /450 competitions, sport flying trips and aviation holidays, on which pilots demonstrated the flight technical qualities of aircraft and their own mastery.

Thus, in the spring of 1910, at the Kolomyazh race course near Petersburg the first All-Russian Aviation Week was held. Universal attention was attracted by the flight of pilot N. Ye. Popov, who made 14 circles on his aircraft above the field of the race course. On the second flight, being in the

air one hour 14 minutes and 41 seconds, he reached an altitude of 518 meters (which at that time was a record) and won the "Grand Prize of Saint Petersburg". Then, Popov set the record for flight duration, flying 2 hours and 4 minutes without landing. On the next day, the pilot was awarded the prize for flight duration, being 3 hours and 15 minutes in the air.

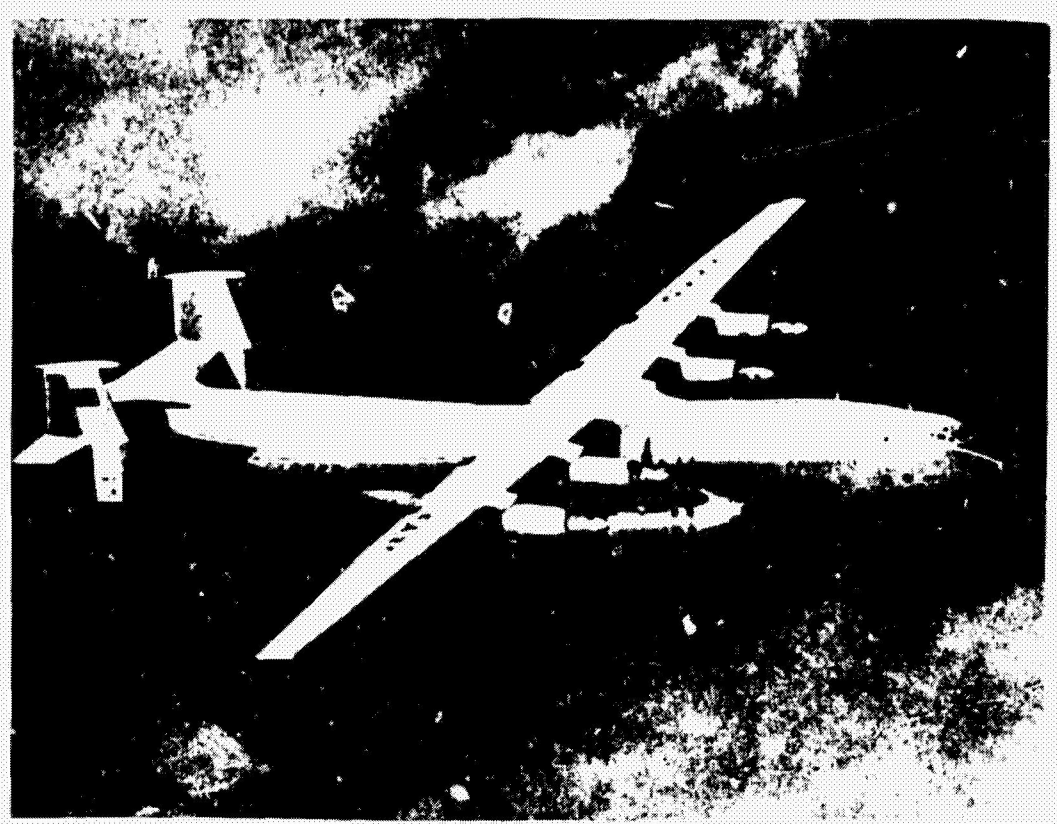


On a Floating Arctic Station. 1966.

The names of the best Russian fliers were also well known abroad. In that same year, at the International Aviation Competitions in France, N. Ye. Popov took first place and received prizes for speed, altitude, distance and circular flight.

Then, M. N. Yefimov won prizes at the competitions in Nice for record flight distance, 130 kilometers, and for the shortest takeoff without passenger and with passenger. He flew more than 600 kilometers during the days of the competition and set a world record for total flight distance. In the competitions at the city of Rouen (France) he also was awarded first prize for lifting the greatest load into the air.

Woman pilot L. A. Galanchikova participated more than once in competitions abroad, setting all Russian and world records for flight altitude (the greatest was 2,400 meters).



The An·ey Aircraft in Flight. 1966.

In 1911, the All-Russian Air Club and the Moscow Airship Society organized a flight from Petersburg to Moscow. Nine people took part in the flight. First place was taken by A. A. Vasil'yev, who covered the 752 kilometers distance with an average speed of 76 kilometers per hour. In total, the pilot was in the air about 10 hours. The newspapers wrote that he had set the all Russian and world records for distance covered in the air.

In 1912, pilot D. G. Andreadi made a record flight along the route Sevastopol' -- Khar'kov -- Moscow -- Peterburg.

The mastery of Russian pilots grew. An inestimable contribution to the development of sport aviation was the invention of the loop by pilot P. N. Nesterov. A new technique of piloting based on Nesterov's discovery found wide application in aviation competitions of the fourth All-Russian Aviation Week. Many pilots successfully made loops and deep banks, which had previously been considered fatal. /451

Sport aviation had great influence on the development of aviation. In various competitions and flights conducted by social organizations, pilot mastery was perfected, new perspectives in the development of flight were opened, the capabilities of aircraft were tested and the requirements of flight technical data for new more improved designs were worked out.

But, under conditions of the capitalist system, sport aviation could not become a mass affair. Its development under the apathetic and partially

hostile attitude of the Tsarist rulers was retarded, and flights were expensive. In particular, before the First World War, those who wished to learn in the piloting section of the air club had to contribute 400 rubles for education and 600 rubles permanent deposit to pay for expenditures in repairing the aircraft due to possible damage. At that time, these were very large sums, and the necessity of paying them made it practically impossible for workers to participate in sport aviation.

The Great October Socialist Revolution gave wings to our people, and as a result of this the pleasure of flying has been achieved by millions of workers.

Sport Aviation in the USSR Before the Second World War

The victory of the Great October Socialist Revolution opened an era of vigorous development and prosperity for our national aviation. The Communist Party and Soviet government attracted the attention of wide masses of laborers to the business of building national aviation. The construction of the Air Fleet became indeed the business of all the people. In March 1923, the Society of Friends of the Air Fleet (ODVF) was founded. The basic purpose of the society, as stated in its regulations, was support of the Party and government in the development of the Air Fleet and aviation industry, the construction of squadrons and airfields and the propaganda of aviation knowledge.

From the very first days of its existence, ODVF carried out great organization and propaganda work among the population. After only one year, the ranks of the society included almost 1.5 million people [430]. The society acquainted its members with the construction of aircraft and aviation engines, /452
organized reports and lectures on aviation and the perspectives of its development, conducted excursions to airfields and aviation enterprises and set up agitation flights, airplane rides for workers. It carried out the collection of voluntary contributions for the construction of aircraft.

The construction of aircraft with voluntary contributions by workers became a noteworthy tradition in our nation from that time. ODVF, and later on the Society of Friends of the Aviation and Chemical Defense and Industry of the USSR (Aviakhim) [The official name of this society if Society for the Support of Aviation Chemical Construction in the USSR -- Tr. note], formed in 1925 as a result of the merger of ODVF and Dobrokhim [Voluntary Society for the Support of Construction of the Chemical Industry], gave the air fleet quite a few squadrons of aircraft, and constructed and equipped airfields with hangars and other installations, from funds collected.

The Communist Party paid great attention to the activities of volunteer defense societies. In its letter to local Party organizations, the Central Committee of the Party stated that the work of the Society of Friends of the Air Fleet had great significance for the defense capabilities of our nation. The Central Committee ordered all Party organizations to give ODVF all possible support and cooperation, strengthening its workers, illuminating its activities in the press and guiding local organizations of ODVF by having them report to

sessions of the Party committees [431].

The chief direction of ODVF activities was the propaganda of aviation knowledge and the involvement of workers in sport aviation. The building of Soviet military and civil aviation and the active operations of ODVF were the start of the development of mass aviation sport in our nation.

Soviet pilots entered the struggle for range and duration of flight. In May of 1923, B. K. Velling flew more than 10,000 kilometers on the route Moscow -- Tashkent -- Moscow. In June of 1925, six aircraft piloted by M. A. Volkovoynov, M. M. Gromov, A. N. Yekatov, N. I. Naydenov, I. K. Polyakov and A. I. Tomashevskiy, started in Moscow and landed in Peking. /453

B. K. Velling

With each year, our aviators laid new routes on the wide spaces of the globe. In 1926, there were the flights of pilots P. Kh. Mezheraun, N. P. Shebanov, M. M. Gromov. Gromov flew the ANT-3 aircraft, "Proletariat" arourd the European capitals: Moscow -- Paris -- Rome -- Vienna -- Warsaw -- Moscow.

In 1927, Osoaviakhim, founded in January of that year as a result of the union of Aviakhim and the Society for Support of Defense, made a great star flight. In spite of the unfavorable meteorological conditions, the flight was successfully made. Twelve aircraft, flying from nine regions of the nation, made landings at the designated times in Moscow.

The wings of Soviet aviation grew ever stronger. In August of 1927, flier S. A. Shestakov on an ANT-3 aircraft made a long-range flight from Moscow to Tokyo to Moscow, covering 22,000 kilometers in 153 flight hours.

In 1929, the crew of pilot M. M. Gromov achieved a glorious success in the ANT-9 aircraft, "Wings of the Soviets" in the circular European flight, Moscow -- Berlin -- Paris -- Rome -- London -- Berlin -- Warsaw -- Moscow. The route of 9,037 kilometers was covered in 53 flight hours, in spite of complex meteorological conditions and a great load on the aircraft.

In the same year, the world press reported a new achievement of Soviet aviation. The ANT-4 aircraft, "Nation of the Soviets" left the Moscow airport. Its course was across the ocean to America. The aircraft flew along the route Moscow -- Omsk -- Novosibirsk -- Krasnoyarsk -- Chita -- Khabarovsk -- Petropavlovsk on the Kamchatka -- Citka -- Seattle -- San Francisco -- Chicago -- New York. The heavy ship was flown by a crew consisting of S. A. Shestakov, F. Ye. Bolotov, B. V. Sterligov and D. V. Fufayev. The mission assigned to the aviators was carried out with honor: they crossed a distance of 21,242 /454

I. K. Polyakov

M. M. Gromov

kilometers in 142 hours, in which over 8,000 kilometers of the route was above water.

The significance of these crossings greatly exceeded the framework of narrow sport purposes: in them the young Soviet aviation technology passed an examination, and the mastery of our fliers was tested and increased. Flights to foreign countries became a political demonstration of the successes of the Soviet state and the growing power ot its air fleet, built by the people.

Together with aircraft, other types of sport aviation developed successfully. Even in 1921, on the initiative of K. K. Artseulova, A. V. Nadashkevich, V. P. Nevdachin, V. S. Pyshnov, N. D. Anoshchenko and others, with the help and support of the Central Administration of the Air Fleet of the Republic, a glider circle was established which received the designation, "Soaring flight". Soon, more than ten branches of "Soaring flight" were counted in different cities, uniting glider sportsmen and designers.

The beginnings of mass Soviet glider work was set up on the first All-Union Glider Competition, organized by ODVF in the autumn of 1923, in Koktebel (Crimea). Among the participants in these competitions were B. T. Goroshchenko, V. S. Pyshnov, M. K. Tikhonaravov, who later became well known scientists; S. V. Il'yushin and A. S. Yakovlev, now general aviation designers whose aircraft are known to all the world; B. I. Cherancvskiy, the designer of aircraft and gliders of the "Flying wing" type; S. N. Lyshin and I. P. Tolstykh, winners of state prizes; pilots L. A. Yungmeyster, K. K. Artseulov and others. The purpose of the competition was the testing of various designs of gliders.

The first flight was made by military pilot L. A. Yungmeyster, who subsequently became the first in our nation to make a soaring flight in bypass currents. At the end of the competition, he soared 62.5 minutes in one of his flights on a glider designed by K. K. Artseulova. L. A. Yungmeyster won prizes for the greatest duration, range and alitude of flight and accuracy of landing. /455

K. K. Artseulov (right) at the Glider Competitions.

Sport gliding quickly won the sympathy of aviators and youth. Beginning in 1923, all union competitions for gliders began to be conducted systematically; they attracted ever larger and larger numbers of participants, stimulated the building of new designs of motorless flying apparatus and facilitated improvement and application of the most advantageous aerodynamic shapes and the development of standards of sturdiness.

Soviet glider men carried out vast experimental work and reached significant sport achievements. Already by 1923-1924, Soviet glider men had mastered flights in bypass currents, and then began to make flights under clouds, at night and over long distances in gliders.

In August of 1925, our glider sportsmen and designers took part in the International Glider Competitions in Germany. Pilots L. A. Yungmeyster, K. N. Yakovichuk and B. N. Kudrin emerged successfully at these competitions. /456

The growth of the air fleet and its ever increasing role in the defense of the nation presented new demands for the development of sport aviation. Under the guidance of the Communist Party, the Leninist komsomol and Osoavnikhim expanded work in reaching wide masses of youth with various types of sport aviation. In the years of the pre-war Five-Year Plan, a wide net of aviation sport training organizations, air clubs, flight, glider and parachute schools and stations and aviation circles arose and increased with every year. Parachute towers were erected, and the number of participants in sporting competitions grew. In 1936, the nation counted 165 air clubs. Two higher schools were opened to prepare instructor cadres, for glider and parachute work,

courses in training pilot instructors and others.

An enormous role in the development of mass sport aviation was played by the Leninist komsomol patronage of the air fleet, set up in 1931. "Komsomol to the aircraft!", this combat appeal of the 9th Congress of the Komsomol found a lively response among komsomols and all Soviet youth.

The komsomol became the leader in the mass development of all types of sport aviation. Komsomols were the initiating founders of aviation circles; from the komsomol emissaries to the air clubs, there later arose quite a few talented aviation commanders, heroic pilots, famous designers, outstanding sportsmen and record setters and champions of the nation and the world. The hands of the komsomols and youth were occupied in off-duty time with the construction of many air clubs and sport airfields, including the Central Air Club of the USSR.

The aviation factories of the nation and the special enterprises of Osoaviakhim developed the series production of training and sport aircraft, gliders and parachutes in the 30's, and produced sets of parts for the construction of aviation models and the equipment of aviation model laboratories. Intensive testing was carried out on sport aircraft in flights at great distances, under complex meteorological conditions and so forth.

N. N. Polikarpov, A. S. Yakovlev, S. V. Il'yushin, B. I. Cheranovskiy, V. K. Gribovskiy, S. P. Kopolev, O. K. Antonov, V. I. Yemel'yanov, G. F. Groshev, D. N. Kolesnikov, B. N. Sheremetev, G. Ye. Kotel'nikov, M. A. Sabitskiy, N. R. Lobanov, the three Doronin brothers and many other designers and inventors worked to build new sport aircraft, gliders, parachutes and instruments.

On 18 August 1933, the first Air Fleet Day of the USSR was celebrated. The sportsmen of Osoaviakhim took part in demonstration exhibitions at the M. V. Frunze Central Airfield. The numerous spectators greeted the appearance of a large group of aircraft forming the letters "USSR" in the sky, with stormy applause. The program of the air parade included also a demonstration of figures of higher pilotage, flights by aircraft of new types and mass parachute jumps. /457

In attracting youth to aviation and sport aviation, the historic flights of pilots V. P. Chkalov, M. M. Gromov, V. K. Kokkinaki and others over previously unknown long routes, their establishment of records for altitude, range and speed of flight, had great influence. In 1938, the International Aviation Federation registered the international womens' record flight for distance without landing by women pilots V. S. Grizodubovoy, P. D. Osipenko, and M. M. Raskovoy.

The 30's were characteristized by a vigorous development of all types of sport aviation. In the air clubs, glider stations and circles set up not only in the area centers, but in many regions, the future masters of aircraft, glider and parachute sport and talented designers grew.

Winners of a State Prize for Sport Mastery in the USSR - the Brothers Doronin.

The necessity arose of setting up a center at which a unified method of training would be worked out for aviation sportsmen, generalizing from the experience of air clubs and recording record achievements. 11 March 1935 was the birthday of the Central Air Club of the USSR. One year later, the Central Air Club became a member of the International Aviation Federation (FAI)[1]. By a resolution of the Council of Peoples' Commissars of the USSR on 5 March 1936, it was given the right to register all union records for aviation sports and send material on them to the FAI for confirmation of sporting achievements as world records. /458

The Central Aviation Club of the USSR became a real forge for noteworthy aviation cadres. The names of Heroes of the Soviet Union who received their first aviation training at the Tushino Sport Airfield are widely famous, V. S. Grizodubovoy, N. A. Ostryakov, P. L. Golovin, I. I. Cherevichnyy, S. N. Anokhin, M. P. Chechnevoy, V. A. Napzhimskiy and many others. Soviet pilots, glider men, parachutists and aviation modelers entered the International Sporting Arena, winning world records and confidently surpassing the achievements of foreign sportsmen.

The social collectives and design groups created in the organization of Osoaviakhim designed and built new gliders, improving their flight technical qualities. At the aviation enterprises, series production was set up for gliders of various types and purposes. Tens of thousands of adolescent boys and girls enthusiastically mastered the art of gliding flight and increased the score of sporting achievements.

1 Since 1959, all types of sport aviation in our nation are united and represented in the International Aviation Federation (FAI) by the Sport Aviation Federation of the USSR.

Sport gliding produced many capable young people. In 1934, driver komsomol S. N. Anokhin (afterwards Hero of the Soviet Union, a famous test pilot and the winner of a state prize), participating in the 10th All-Union Flight Assembly of Glider Men, soared on a GN-2 glider designed by G. F. Groshev for 32 hours without landing above the city of Klement'yev and the Crimea. Very soon, this record, which greatly exceeded the achievements of foreign glidermen, was surpassed by N. Ya. Simonov, who made a flight on a glider designed by V. K. Gribovskiy for 35 hours and 11 minutes.

At the 11th All-Union Flight Assembly, I. M. Sukhomlin, utilizing the force of rising currents, was in the air without a landing for 38 hours 10 minutes in a single place glider, and V. L. Lisitsyn flew 38 hours 40 minutes with a passenger on board.

The Soviet glidermen established outstanding records also for flight distance. In October 1937, V. M. Il'chenko flew a straight line distance of 133.4 kilometers in a two-place glider. This was the first Soviet world record officially registered by FAI. In the following year, three world records (539, 602 and 652 kilometers) were set by V. M. Rastorguev. The world record for distance with a two-place glider was set by V. M. Il'chenko, at 407.66 kilometers. Three world records for multi-place gliders (distance to the planned point, 495.02 kilometers, distance of flight in a straight line, 619.7 kilometers and distance of flight with return to the start, 416.07 kilometers) were set by sportsman I. L. Kartachev. /459

Young ladies also actively participated in the struggle to set world (4") records. M. K. Ratsenskaya (today a meritorious sport master) established in 1935, the women's world record for duration of flight in a single place glider (15 hours 39 minutes), greatly exceeding the achievements of foreign sportswomen. World records for distance of flight in a glider were established by O. V. Klepikova. She flew from Moscow to the region of Stalingrad, covering a distance of about 750 kilometers.

The young glider woman did not achieve success immediately. The first time she tried she could not master soaring flight at all. It was difficult for her to learn to find the rising currents without error. After all, glider sport has its own specific pecularities. If the pilot sportsman or motorcycle sportsman has a good machine and prepares himself outstandingly, success is assured. In addition to personal preparation and good glider, the glider pilot requires favorable meteorological conditions. However, he must be able to determine and correctly utilize these conditions. Ol'ga Klepikova practiced persistently for several years before she learned to fly tens and hundreds of kilometers in a glider.

The flight in which the world record was established began on the morning of 6 July 1939, the meteorological conditions were not completely favorable. From Tushino to Kolomna, the sportswoman flew at an altitude of only 200 to 300 meters with a side wind. It was necessary to fight for every meter of altitude. With great difficulty, Klepikova finally gained 1,000 meters and flew over Oka. Beyond the river, she found a belt of rising currents and flew

a significant distance in a practically cloudless sky. Tambov was behind her. The glider pilot flew over the fields of the Stalingrad area. At 7:00 in the evening, when the rising currents had completely disappeared, Klepikova selected a good landing area near a village and made a landing. That evening, the world record holders welcomed the worker of the Otradnoe State Farm to themselves. Ol'ga Klepikova had flown 749.203 kilometers straight line distance.

28 years have passed, but the world record of the Soviet glider woman has not been surpassed by any woman in the world.

Soviet sportsmen laid the foundations and thoroughly developed the art of /460
higher pilotage in gliders. Nesterov's first loop, a wing roll, spin and inverted flight in a glider were performed by one of the outstanding pilots of glider work, V. A. Stepanchenok.

Our sportsmen mastered gliders towed by motorcycles and automobiles. They were the first in the world to lift a glider from the ground by a passing aircraft, achieved great successes in towing gliders as "glider trains", conducted great work in studying and mastering flights in thermal currents and developed a method for performing figures of higher pilotage in gliders.

From 1936 to 1940, Soviet glidermen set 13 of 18 world records. All the basic men's and women's records for length of flight, length of flight with return to the start and flight to a previously designated point, both for single place and multi-place gliders, belonged to our nation.

Glider activities proved themselves as one of the measures of mass preparation for qualified cadres. Thousands of adolescent boys and girls went through sport gliding to large aviation, sat at the controls of combat and civil aircraft and became workers in aviation industries.

The record book for mass parachute sport in our nation was opened on 26 July 1930 at the training assembly of military pilots in Voronezh, when the first group parachute jump was made. The number of parachutists grew quickly. The beginnings of the first achievements were made by L. G. Minov, Ya. D. Moshkovskiy, N. A. Yevdokimov, B. N. Petrov and others.

The first world record was quickly set. It was established by S. A Afanas'yev, who left his aircraft at an altitude of 2,000 meters and fell 1,600 meters without opening his parachute, surpassing the previous achievement of an American sportsmen.

In the following year, our parachutists demonstrated high results in delayed jumps. Thus, on 21 August 1933, N. A. Yevdokimov exceeded the world record set by Tranum (England). The Soviet parachutist left the aircraft at an altitude of 6,920 meters. His free-fall lasted 115 seconds to an altitude of 480 meters.

Soviet parachutists jumped from various parts of the aircraft, from balloons and from dirigibles, while the aircraft was making figures of higher

pilotage, made jumps by day and night, on land and in the water.

In 1934, Z. V. Bushueva set the first women's world record in the nation for delayed jump. Two days later, her record was exceeded by N. A. Kamneva, who made a jump from an altitude of 3,000 meters and fell 2,700 meters in free- /461
fall in 58 seconds. One after another, world records for high altitude jumps were established by K. F. Kaytanov, V. I. Fedorova and N. A. Amintayev.

In 1935, six komsomols, O. N. Yakovleva, N. V. Babushkina, M. N. Bartseva, S. P. Blokhina, M. G. Malinovskaya and A. N. Nikoleyeva, made a group jump from an altitude of 7,035 meters without oxygen devices. World records were set by T. A. Kutalova (7,750 meters) and G. B. Pyasetskaya (7,923 meters).

The organizer of mass parachute sport was the Leninist komsomol. Parachute work became part of the defense work of the komsomol organizations. On a suggestion of the Central Committee of the All-Union Leninist Communist Youth Union, parachute jumps were included in the complex of military technical knowledge. The youth, moved by a patriotic desire to prepare themselves well for the defense of the motherland, filled the parachute circles of the air clubs. The defense significance of parachute sport became extremely important in connection with the establishment of airborne troops in the Red Army. Parachute sport became a reliable source for filling the airborne ranks with trained warriors.

In May 1935, noting the successes of parachute sport, the Soviet government decorated a large group of sportsmen with orders. Among those decorated were L. G. Minov, N. A. Yevdokimov, K. F. Kaytanov, N. A. Kamneva, V. N. Fedorova, V. N. Yevseyev, Ya. D. Moshkovskiy, O. N. Yakovleva and others. Later, orders were received by V. I. Kharakhonov, N. A. Ostryakov, N. A. Amintayev, A. M. Foteyev, G. B. Pyasetskaya and A. A. Shishmareva.

At the end of 1937, the aviation sportsmen of the USSR occupied fifth place in the tables of the International Aviation Federation for the number of world records they held, and at the beginning of 1940, first place. In the pre-war Five-Year Plan, our pilots established 62 world records for distance, altitude, speed of flight and weight carried, out of 168 registered by the FAI.

In the pre-war years, Osoaviakhim became a patriotic organization of many millions of members. The air clubs served as a founding base for staffing the military and civil aviation schools. In 1940, there were four aviation schools producing pilot instructors in the nation, 182 air clubs, 36 glider and 12 aviation clubs.

In 1940, the training organizations of Osoaviakhim prepared: more than 24,000 pilots, 428 pilot-instructors, 3,107 aviation technicians, more than 22,000 parachutists, about 300 parachute instructors and 4,156 glider men.[1]

[1] See the patriotic defense organization -- Osoaviakhim. Historical reference. 1927-1948 (Central Archives of the Central Committee of the All-Union Volunteer Society for the Support of the Army, Aviation and Navy of the USSR).

The military air forces, airborne troops, civil air fleet and aviation industry /462
obtained outstanding additions from the youth trained by Osoaviakhim.

Everything for the Front, Everything for Victory

The Second World War began. In these difficult and terrible years for our nation, the activities of Osoaviakhim were completely subordinated to one demand, everything for the front, everything for victory over the enemy. In the autumn of 1941, several regiments of night bombers were formed from the instructors and best p_pared pilots of the air clubs. Many sportsmen and club workers were sent for retraining and then put into the combat regiments of all types of aviation. A significant portion of the instructors in the air clubs were sent to aviation training centers and schools, preparing cadres for the front. Parachute sportsmen were sent to airborne chast's, glidermen replaced their light winged sport machines with landing gliders.

Many of those trained by the air clubs were distinguished in battle with the enemy by their daring, audacity and high combat mastery. It is well known, that three time Heroes of the Soviet Union A. I. Pokryshkin and I. N. Kozhedub, and almost half the two times winners of the Gold Star, including B. F. Safonov, A. I. Molodchiy, N. M. Skomorokhov, A. Ye. Borovykh, G. A. Rechkalov, M. P. Odintsov, L. I. Beda and others, received their first flight training in air clubs.

A trainee of the Yaroslav air club, fighter pilot M. P. Zhukov, rammed a German bomber in the first days of the war. Defending the city of Lenin, he joined unequal battle with nine fascist fighters and perished heroically. 36 enemy aircraft were annihilated in air battles by Hero of the Soviet Union G. K. Gul'teyev, a former sportsmen of the Serpukhov air club.

At the start of the war, pilot V. L. Krotevich of the Moscow Subway Construction Air Club went to the front at a volunteer. Fighting with the 35th Attack Bomber Regiment of the Red Banner Baltic Fleet, on 19 November 1943, he repeated Gastello's deed and directed his flaming aircraft at an enemy ship, sinking it.

The builders of the underground routes learned to fly aircraft and gliders and to make parachute jumps, in their spare time. Seasoned in the struggle with difficulties under ground and at the sport airfield, they gave examples of bravery and unlimited dedication to the motherland in the difficult years of the war. 25 trainees of the Subway Construction Air Club became Heroes of the Soviet Union.

The former subway builder, attack bomber pilot Boris Semenovich Okrestin, /463
gave his life in the struggle for the liberation of Belorussia. He also repeated the deed of Nikolay Gastello, flying his burning aircraft with its bomb load into a mass of enemy troops and technology.

The famous attack bomber pilot Anna Aleksandrovna Yegorova (Timofeyeva) battled heroically with the enemy, and was awarded the designation Heroine of

the Soviet Union, in connection with the 20th Anniversary of the victory of Hitlerist Germany.

Page One Title

Air club member Vasiliy Sergeyevich Kotlov fought bravely on the fronts in the Second World War. Now he serves as a test pilot, a Hero of the Soviet Union.

Cover Page Title

Air club pilot instructor Vladimir Aleksandrovich Narzhimskiy battled the German invaders from the first to the last days of the war. His fighter was a terror for enemy pilots. In air battles, the pilot shot down 18 aircraft.

A heroic deed was performed during the defense of Moscow by Konstantin Yakovlev, a trainee of the V. P. Chkalov Central Air Club of the USSR. In the autumn of 1941, the Hitlerist hordes rushed toward Moscow. On the morning of 17 October, the command point received information of a great accumulation of enemy tanks and trucks in the region of the Borofino Field. A group of aircraft flew out to attack them, including the unit of Junior Lieutenant K. A. Yakovlev.

Cover Page Source

Violently rushing passed the "slim", they left behind on the ground mutilated fascist tanks. And when the last bombs were dropped, an enemy anti-aircraft burst struck Yakovlev's machine. Flames enveloped the cabin, the hands and face of the pilot were roasted, but he continued to battle. When he was out of ammunition, the pilot aimed his flaming aircraft at the crowded column of tanks...

(4")

At 18 years of age, Konstantin Yakovlev joined the Central Air Club. Working the Frezer factory as a machinist, the young man successfully mastered the technique of piloting the training aircraft. In 1938, on a permit from the Komsomol, the young pilot was accepted in the Odessa Military Pilot School.

On the eve of the first day of the war, Junior Lieutenant Yakovlev was on duty close to the western border and entered combat directly after the treacherous attack by fascist Germany on our motherland.

On 25 June 1941, Yakovlev's fighter was shot down in unequal air combat. The pilot bailed out and landed on occupied territory. However, he succeeded in hiding himself from the enemy and crossed the front line.

After a short rest, Yakovlev was sent to an attack bomber unit near Mowcow.

The 23 year old communist Konstantin Yakovlev repeated Gostello's deed on the soil of Moscow. /464

Grigoriy Myl'nikov came from the Voronezh Air Club to military aviation. He began the war in a fighter, then switched to an attack bomber. He made 223 combat flights and participated in 47 air battles. The glorious combat merit of G. M. Myl'nikov was noted by awarding him the designation Hero of the Soviet Union, decorating him with a second Gold Star medal and also with many orders and medals.

Now the hero of the war is on the labor front. He participates actively in the work of DOSAAF in Moscow and the Moscow region, propagandizing the deeds of Soviet aviators among the youths.

For the famous fighter pilot, Junior Lieutenant A. V. Alekyukhin, the air club was also the first step to his great deed. He was one of the first to meet the enemy from the Odessa Airfield. He fought at Odessa, Khar'kov and Stalingrad, participated in the advancing battles near Rostov, Taganrog, Melitopol', and in Germany. He personally shot down 40 enemy aircraft and in group battles, 17. In autumn of 1943. A. V. Alekyukhin was awarded the designation Hero of the Soviet Union for combat deeds, and after a few months he received a second Gold Star medal. Having completed two military academies, Guards Colonel Alekyukhin continues his military service.

Sportsman S. N. Anokhin systematically made dangerous flights on a glider to the enemy rear. He supplied arms, medicine, ammunition, equipment and clothing to partisan bases. S. N. Anokhin received his first Order for evacuating wounded partisans, women and children by air to our major area.

Here is how one of his flights went.

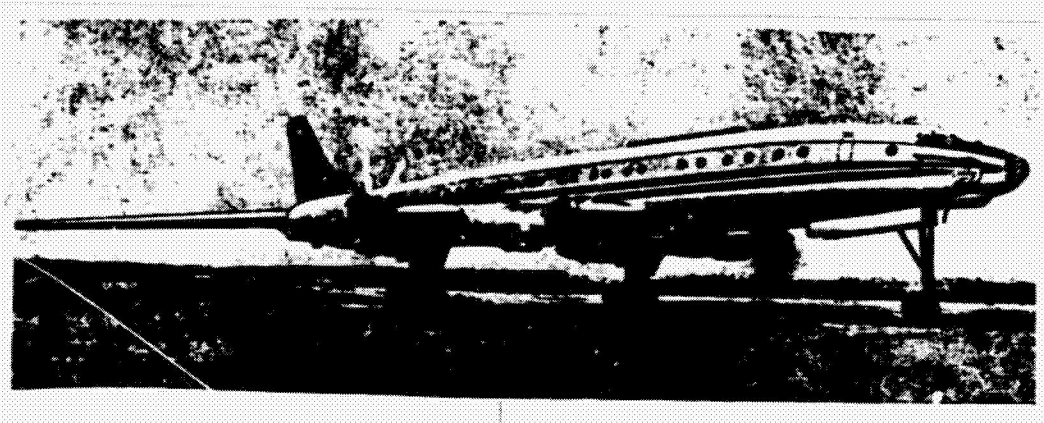
By order of the command, a group of landing gliders loaded with arms, ammunition, necessary supplies and medicines flew to the partisans of Belorussia. At night, the air train crossed the front line and approached the partisan's airfield safely. Separating themselves from the towing airplane, the heavy machines began to land. Below, small bonfires marked the landing area on which the pilots were to land the gliders. Landing on a limited area, and even more so at night, requires great skill from the glidermen.

In peaceful times, the soaring sportsmen had frequently landed their sport machines under complex conditions, and the pre-war tempering helped them this time. All the delivery machines landed in the assigned place.

The pilots were surrounded by partisans, who quickly began to unload. Anokhin was approached by a tall bearded man with an automatic rifle on his shoulder, who reported, "Comrade instructor, the Mstitel' partisan detachment /465 conducts combat operations for the annihilation of the fascist invaders successfully! Detachment commander, your former student Sidyakin!"

In this strongly built man with a long beard, it was difficult to recognize the well proportioned boy who had begun to fly gliders with him many years ago. Only the mischievous eyes and soft voice revealed it to be Sidyakin. The instructor and former student embraced each other.

While they were going to the headquarters, Sidyakin told him about the partisan life. After great battles, the peoples avengers had won the city of Begoml', which later became the center of the partisan movement deep in the enemy rear, from the fascists.



Tu-114 Passenger Aircraft.

Stewardesses Who Have Flown over Three Million Kilometers. From top to bottom. E. Patrusheva, Ye. Chudakova, Z. Astasheva, G. Gitsevich, R. Tokareva and G. Gruznykh.

NASA

For successfully fulfilling combat assignments, Konstantin Sidyakin had already been awarded the Order of Lenin.

The partisan was interested in how things went in Moscow, how the business was going at the front, and how the factories producing arms and ammunition which they needed, were working. But they were all especially worried about the apparently hopeless position with the wounded. Many needed immediate operations, but there were no surgeons.

"The wounded must be removed, Sergey Nikolayevich," said Sidyakin. "Help is needed, but it is impossible for a large airplane to land anywhere."

"And is it impossible to remove the wounded on gliders?" Anokhin suggested. After conferring, the detachment command agreed to accept this suggestion.

The risk was great, but there was no other way out. By radio, in code, they requested a tow airplane with experienced pilot Chelyuskin.

When dawn came, Anokhin paced off the area. He made a calculation. He

weighed all the variants. The length of the field was really pretty small. But exact calculation and glider pilot's intuition indicated that it would still be possible to take off.

When night arrived, everything was ready to receive Zhelyutov's aircraft. It was necessary to solve a difficult question: whom to take from the wounded? There were more than the glider could take. The planned number of wounded were loaded. Still people were lying on the carts.

"We can take two more," Anokhin said, "the wind has picked up a little, it will easier to take off." And he permitted them to load on a few more people.

Zhelyutov arrived. The glider was connected to the aircraft by a short line, not more than 25 meters.

"Well, good luck!", said the partisans excitedly.

Anokhin glanced into the load section, where the wounded lay. Some of them, alarmed, groaned.

Cover Page Source

"Bear with it, brothers, we're taking off now." The pilot soothed them. /466

After a few minutes, the air train moved from its place. The towing aircraft's motor strained and roared. Anokhin strained himself to the limit. Strictly maintaining control during the takeoff, without making any error in piloting the overloaded machine, all the thought and will of the pilot were concentrated on this.

The bonfires passed rapidly under the wings. The end of the takeoff area approached rapidly. Sergey pulled the control stick towards himself and the glider lifted into the air. Ahead he could already see the shadows of bushes, and the aircraft still had not lifted itself from the earth. "Is it possible I miscalculated?", the thought flickered. A cold sweat came on his forehead. His back was wet. He moved the stick away from himself a little, to reduce the resistance for the aircraft, and saw that at the last moment, at the very edge of the field, the towing aircraft jumped up and passed over the bushes.

"We made it! Everything is in order now!", Anokhin wiped away the sweat.

However the "order" did not last long. Over the front line, the air train came under heavy fire. It was difficult to maneuver, but the experienced pilots safely reached their own airfield.

At the airfield, more unpleasantness awaited them. On the previous day, there had been an attack by a large group of Henkels, and it was necessary to land between bomb craters. And finally the glider came to a stop. The flight was over.

Anokhin looked at the wounded.

NASA

"Our friend! you have saved our lives.", he heard the voice of one of them. "Thanks a lot!"

Page One Title.

And there were quite a few such saved lives credited to the glorious glidermen during the war.

Cover Page Title

Glider Designer V. K. Gribovskiy and pilot V. A. Stepanchonok at the Glider Competitions in Koktebel'. 1932.

M. I. Kalinin Awards an order to Parachute Record Holder Ya. D. Moshkovskiy. 1935.

In the post-war years, Sergey Nikolayevich Anokhin participated more than once in all-union glider competitions, winning the designation Champion of the USSR, and in air parades at Tushino, he demonstrated high pilotage with a glider.

A meritorious test pilot, a meritorious sport master, the winner of a state prize, Hero of the Soviet Union Sergey Nikolayevich Anokhin is still involved with glider affairs.

One of the regiments of night bombers was staffed almost completely with sportsmen pilots trained in the Osoaviakhim air clubs. This regiment was recorded in the annals of the Second World War as the 46th Guards Taman Orders of the Red Banner and Suvorov Women's Night Bomber Regiment.

Marina Pavlovna Chechneva, a trainee of the Moscow Air Club, was a squadron commander in this regiment. In 1938, she made her first flights, and in the spring of 1940, together with a certificate of completion of the ten year school, she obtained a certificate of completion from the training program for pilot instructors. /467

Tat'yana Makarova and Marina Chechneva Before a Combat Flight.

The young girl taught others to fly, and at the same time she herself learned from more experienced instructors.

At the beginning of the Second World War, she voluntarily joined the Army. She was made a member of the Women's Night Bomber Regiment. First there was training, and then combat activity began soon.

...In May 1942, the Women's Night Bomber Regiment was ordered to bomb military objectives in one of the regions of the Donets Basin. The pilots approached the target at an altitude of 1,200 meters in Po-2 aircraft. /468 Flare bombs illuminated the bombing region. In the distance, Marina Checheva saw the silhouettes of extinguished coke ovens, the outlines of blast furnaces destroyed by the Hitlerists, the ruined works of a great metallurgical factory. Her heart was boiling with rage. She dropped her bombs accurately on the target and saw that the military objective was covered with smoke and flames.

In the village of Pokrovskoe, near Taganrog, the fascists chased out the inhabitants, constructed ammunition warehouses and located powerful reserves of

troops. Around the village, the enemy set up antiaircraft chast's, which opened heavy fire anytime our night bombers appeared in the sky.

The command ordered the pilots of the Women's Regiment to annihilate the military objectives in Pokrovskoe. During the time of this attack, our aircraft were under the clear fire of the Hitlerist antiaircraft men. The enemy searchlights succeeded in getting their beams crossed on Chechneva's aircraft. Then the young girl began to maneuver. She threw her machine sharply from side to side, changed her speed, dropped down like a stone, but the beams of the searchlights still held her, and the antiaircraft men maintained a steady accurate fire.

Chechneva's friends, participating in the operation, saw how the aircraft flew aimlessly for more than a kilometer at 150 meters from the ground and hid itself in the darkness. They decided that the aircraft had been destroyed and Chechneva had perished.

Having carried out their assignment, the pilots returned to the airfield. They waited half an hour, an hour for Marina. No doubt remained to anyone: she had perished. A little more time passed, and suddenly at the airfield they heard the dull roar of a motor. Soon, a Po-2 aircraft appeared from behind the forest in low level flight. Marina Chechneva had returned.

"I was saved by a trick and sport training." she explained to her friends. "I imitated a random fall. The Hitlerists decided they had shot me down and turned the beams of the searchlights away from my aircraft. Close to the earth, I straighted out the crippled machine, gained altitude again, passed over the target from the rear and dropped all my bombs. I only flew away after I saw a big fire."

To the last days of the war, Marina Chechneva struggled with the fascist invaders. She made 819 combat flights. She was designated Hero of the Soviet Union.

After the war, Marina Pavlovna Chechneva returned to the V. P. Chkalov Central Air Club. She once again took up training aviation sportsmen. Together with her comrades in sport, the pilot frequently appeared at air parades, leading stunt flying groups. On a Yak-18 sport aircraft, she set an all-union speed record. /469

Later Marina Pavlovna was chief of the flight section of one of the Moscow air clubs.

Having left flight work due to the state of her health, Chechneva conducts great social activity. She is a member of the Presidium of the Committee of War Veterans, the deputy chairman of the Society of Soviet Bulgarian Friendship, a member of the editorial staff of the journal *Kryl'ya Rodiny*. She can frequently be seen at factories and shops, in institutes and schools, in various institutions and pioneer camps, where the heroine tells of the military deeds of our warriors who destroyed the wicked enemy of mankind, fascism.

In the summer of 1940, the 18 year old graduate of the Kiev school, student pilot of the city air club Natasha Meklin completed the final test flight and entered the Moscow Aviation Institute. Her training was interrupted by the war. Learning of the establishment of the Women's Aviation Regiments, Natasha was one of the first to sign up in the attack bomber group.

Together with her combat friends, she struck against the hated invaders. For bravery and daring, Natalya Fedorovna Meklin was among 23 girls designated as Hero of the Soviet Union.

The same age as the Great October Revolution, Klavdiya Fomicheva began with glider flights, and then became an instructor, working in the Reutov Regional Air Club of the Moscow area. Over 60 of her students who had successfully finished the air club entered the military aviation schools, and became combat pilots.

In the first days of the war, Fomicheva submitted a request to be sent to the front to the commissariat of war.

In autumn of 1941, she was already flying Pe-2 dive bombers. Soon, Formicheva became the successful leader of a military mission unit, and then a squadron. More than once, the brave pilot was wounded, but she always returned to battle and continued to fight right up to the day of victory.

For combat deeds, Klavkiya Fomicheva was designated Hero of the Soviet Union.

Many air clubs of the nation were converted to military aviation and glider schools during the war years. They trained pilots, parachutists and glider pilots for the Red Army. All together, during the war years, the air clubs prepared about 60,000 aviation specialists of various kinds. [1]

In addition, members of Osoaviakhim carried out great agitation-explanation/470 work among the population, describing the combat activities of Soviet aviation and the feats of the aviators.

Air club workers took active part in the public movement to help the front. Osoaviakhim collected and transmitted to the state over 272 million rubles for the construction of combat technology. A portion of these funds was expended on constructing 19 squadrons of combat aircraft. The patriotic activities of the defense society received high appraisal from the Soviet government: on 22 January 1947, Osoaviakhim was awarded the Order of the Red Banner.

Once Again in the Peaceful Sky

After the end of the war, the Communist Party and the Soviet government

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[1] See the Patriotic Defense Organization -- Osoaviakhim. Historical reference. 1927-1948 (Central Archives of the Central Committee of DOSAAF of the USSR.)

took measures to restore and further develop sport in the nation. Those who had occupied themselves with aviation sport before the war returned from the front to the national air clubs; they formed the basic skeleton of leadership and instruction cadres. Inspired by the combat glory of the Soviet Army and its aviation, and desiring to follow the example of their heroes, the youth joined the air clubs, and under the direction of experienced aviators, they mastered the art of piloting aircraft and gliders and mastered parachute jumping. In 1946, in the first post-war air parade held at the Tushino Airfield, a great place was occupied by an exhibition of aviation sportsmen. Soon these sportsmen pilots opened the account of achievements in peaceful years. The first records were set in aircraft of sport categories.

On 6 September 1949, Ya. D. Forostenko made a record flight in a Yak-18 aircraft around a closed 1,000 kilometer course, and reached a speed of 223.56 kilometers per hour. On 12 July 1951, in a Yak-11 aircraft he set a new world record, developing a speed of 471.348 kilometers per hour on a closed 500 kilometer course. Ya. D. Forostenko is the developer of many record setters, and experienced methods specialist, a frequent participant in air parades and now a meritorious sport master and meritorious trainer of the USSR.

A world record in flight speed was established in 1949 by the former woman subway construction worker, instructor of the Central Air Club of the USSR, A. I. Bodryagina. On a 100 kilometer triangular course, she reached an average speed of 262.771 kilometers per hour in a Yak-18 aircraft. For this flight, the International Aviation Federation awarded Bodryagina the Louis Bleriot Medal.

In the autumn of 1949, at the Tushino Airport, the first post-war All-Union Sport Pilot Competition took place. 50 of the best sportsmen of the nation took /471 part in it. First place in these competitions was also taken by A. I. Bodryagina. The title of Absolute Champion in Airplane Sport was also won by her at the Second All-Union Competitions which took place a year later.

The period from 1951 to 1953 was characterized by the further growth of sport achievements. All-Union and world records for altitude, speed and flight distance in sport aircraft were established by N. M. Golovanov, V. Ye. Shumilov, M. P. Chechneva, M. G. Meylakhs and I. P. Kirilyuk.

A significant sport achievement of those years was the record flight by meritorious sport master of the USSR P. I. Zakhudalin. On 31 October 1953, he flew a Yak-11 aircraft 2,000 kilometers in five hours 35 minutes 30 seconds, at an average speed of 360 kilometers per hour. This world record remained for a long time on the books of the FAI.

Once again, the blue sky blossomed with the multi-colored canopies of parachutes. The parachutists renewed their storming of the stratosphere, their battle for accurate landing and the art of steering their bodies in free fall. The Soviet sportsmen bravely followed the path of new discoveries.

In connection with the increase in flight altitude of aircraft, the

parachutists had the problem of mastering various kinds of jumps from high altitudes and developing their methods.

On 25 September 1945, sport master V. G. Romanyuk made a delayed jump from the stratosphere. At that time, there was not sufficient experience of such jumps. He flew five kilometers, without trying to strictly stabilize the position of his body. Then, he thrusts his hands forward and somewhat to the sides, straightened out and extended his legs. The fall became stable. The parachutists fell prone, face downward. And when there was only 1,000 meters to the ground, Romanyuk pulled the rip cord.

Barograms showed that Romanyuk left the aircraft at an altitude of 13,108.5 meters. The free fall lasted 167 seconds. In this jump, the sportsman surpassed all previously existing achievements both for height and duration of free fall.

In 1947, Romanyuk set a new record, jumping from an altitude of 13,400 meters with immediate opening of his parachute canopy. This jump was made to study how a man would feel in a slow descent from the stratosphere.

In Soviet aviation sport, V. G. Romanyuk has earned the designation Parachutist Number One. The count of his jumps passed three and a half thousand long ago. He has jumped from various types of aircraft, from gliders and balloons, jumped with all possible loads and from various aircraft positions. For experimental purposes, the parachutist has landed on the ground, on snow, in water and on ice. His name has been entered many times in the lists of world and all-union record holders. Romanyuk has been designated Hero of the Soviet Union, he is a meritorious sport master and a meritorious trainer of the USSR. /472

V. G. Romanyuk

After Romanyuk, record jumps from high altitudes were successfully made by N. Ya. Gladkov, A. A. Petkevich and others.

On 22 June 1949, parachutists of the Central Air Club of the USSR P. P. Polosukhin, S. A. Korobov, V. Z. Krivoy, Ye. N. Vladimirskaya, K. Ya. Yerpichev, V. A. Ivanov and V. L. Dorosev made the first group night jump in the world from an altitude of 10,370 meters.

More and more new groups of parachutists lifted themselves by day and night to great altitudes and then abandoned the aircraft. A group delayed jump from an altitude of 6,200 meters without oxygen apparatus was made by Ye. N. Vladimirskaya, G. B. Pyasetskaya and N. Ye. Yesionova. They flew 5,419 meters in free fall. Their achievements were entered in the lists of world and all-union records.

On 20 August 1951, the Council of Ministers of the USSR made a decision to unite the voluntary societies, DOSARM [All-Union Voluntary Society for the Support of the Army of the USSR], DOSAV [All-Union Voluntary Society for the Support of Aviation of the USSR], and DOSFLOT [All-Union Voluntary Society for the Support of the Fleet of the USSR], into which Osoaviakhim had been divided in 1949, in one All-Union Voluntary Society for the Support of the Army, Aviation and Fleet (DOSAAF SSSR). This measure was favorably reflected in the further development of aviation and other military technical types of sport.

The years of the 50's were characterized by new high achievements of aviation sportsmen of the USSR. In connection with the development of jet aviation, the records of the FAI opened new divisions: world records for aircraft with jet and turboprop engines. In the constant competition of aviators of the entire world for speed, distance and altitude of flight, Soviet pilots, flying jet and turboprop engines made by national designers demonstrated outstanding results. /473

The International Aviation Federation registered world records for altitude and speed of flight, achieved by military pilots V. S. Il'yushin, G. K. Mosolov, V. P. Smirnov, A. S. Lipko, Yu. T. Alasheyev, V. F. Kovalev and others. The crew of a Il-18 aircraft captained by the well known record setting pilot V. K. Kokkinaki surpassed eight world records for speed, flight altitude and lifting capacity in 1959.

A new type of sport arose in our nation, helicopter sport. The specific properties of rotating wing flying apparatus and their unique takeoff and landing qualities attracted the attention of aviation sportsmen. The new type of aerial sport quickly won the sympathy of youth. Exhibitions by helicopter sportsmen became an indispensable part of aviation holidays.

One of the first record setters in this type of sport was pilot V. V. Vinitskiy. On 26 February 1956, in a Mi-4 with a commercial cargo of one ton on board, he reached an altitude of 6,048 meters, setting a world record. In 1959, there followed a series of his new record flights. In May, V. V. Vinitskiy flew a 500 kilometer closed course in a KA-15 helicopter at a speed of 170.445 kilometers per hour, surpassing by 63 kilometers per hour the previous results of French pilot Vh. Bule. A few days later, in a Mi-1 helicopter, he reached a speed of 196.412 kilometers per hour in flight on a closed 500 kilometer course and a speed of 210.535 kilometers per hour on a closed 100 kilometer course.

Significant achievements in a Mi-1 helicopter were established by sportsman F. I. Belushkin.

On 1 January 1960, of 35 records for helicopters registered by the FAI, Soviet sportsmen owned 14. The name of Soviet pilot R. I. Kaprelyan appeared three times in the list of world records, for lifting the maximum cargo of 12,004 kilograms to an altitude of 2,000 meters, for making record flights at an altitude of 6,018 meters with a load of two tons and at an altitude of 4,885 meters with a load of ten tons.

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The first women's record for helicopters in our nation was set by sportswoman Irina Gurova. On 28 March 1958, she flew a Mi-1 helicopter on a 100 kilometer closed course with an average speed of 175.459 kilometers per hour, opening the gates to a flood of women's world records in helicopters.

Five out of five! At the middle of 1960, that was the count of helicopter records. All five world women's records were earned by komsomols I. I. Gurova, /474
T. V. Russiyan and A. A. Geppener. Helicopter sport confidently went on to new bounds, marking its path with great sporting victories.

Glidermen took part in sportsmens competitions. In the post-war years, aviation clubs took energetic measures to restore glider work, based on the active assistance of experienced glidermen returning from the front.

At the 17th All-Union Competitions, which took place in 1951, more than 50 powerful glidermen of the nation took part. The designation Absolute Champion of the USSR was awarded to the repeated record setter, V. M. Il'chenko.

Youth appeared successfully at the competitions also. Sportswoman M. P. Pylayeva set a world record, significantly surpassing the result which previously belonged to a French sportsman.

Two years later, a significant victory was once again won by V. M. Il'chenko. On 26 May 1953, with a passenger on board, he took off on an A-10 glider designed by O. K. Antonov and, separating himself from the aircraft in the region of Kuntsevo, he set a course for Volgograd. In nine hours, he flew 829. 882 kilometers straight line distance. The previous world record for distance, established in 1938 and also belonging to the Soviet Union, was exceeded by 210 kilometers. For this flight, V. M. Il'chenko was awarded the Great Gold Medal of Lilienthal by the FAI.

In June of 1954, a team of glidermen consisting of V. M. Il'chenko, V. I. Yefimenko and M. M. Veretennikov took second place in an international competition held in the city of Leszno (Poland).

The post-war years were characterized by a further growth of mass parachute sport. Soviet sportsmen improved methods of making jumps from high altitudes with delayed parachute opening, the accuracy of landing, the control of the body in free fall, and the performance of acrobatic figures in the air. A special amount was done in this direction by V. G. Romanyuk, N. Ya. Gladkov, P. A. Stolchienko, G. B. Pyasetskaya, V. M. Seliverstova, D. T. Zhornik, K. V. Kushnikov, F. P. Neymark and others.

From the end of 1952, the International Aviation Federation began to register world parachute records. Among the first world achievements were seven records set by Soviet sportsmen in jumps from high altitudes with delayed parachute opening.

Soon, of 29 all-union records established by the parachutists of our nation, 28 were registered by the FAI as world records. The number of boxes in the tables of world records, filled with the names of Soviet sportsmen,

grew steadily. And at the end of 1954, all world records for parachute sport except one belonged to the Soviet Union. The record holders of the world included moskovites, sportsmen from Minsk, Kiev, Voronezh, Dnepropetrovsk, Sverdlovsk, Krasnoyarsk, Donets, Kolomna, Perm', Ivanov and other cities. /475

The basic foundation of the parachute art was and remains accuracy of landing. In parachute sport, it is usually called the heart of the sportsmen effort. This type of jump provides a strict check of the parachutists mastery, the accuracy of his estimation and his ability to steer the canopy. Soviet sportsmen can rightfully be called the original developers of this type of jump. Our parachute schools and their best representatives have accumulated enormous experience and developed methods which ensure the achievement of high results in the struggle for accuracy in parachute landings.

Thanks to the efforts of Soviet sportsmen, the "circle of accuracy" has been reduced. In 1955, a komsomol girl from Makhachkala, Aminat Kaziyena Sultanova made a day jump with a landing accuracy of 3.4 meters from the center of the circle from an altitude of 600 meters. This record lasted a long time in the books of world achievements.

Cover Page Source

In the same year, a komsomol girl parachutist from the city of Saransk, Galina Dmitriyevna Mukhina, made a combined day jump from an altitude of 1,500 meters and achieved an average accuracy result in two jumps of 7.08 meters. This was simultaneously a world record not only for women, but also for men. Mukhina more than once made skillful combined jumps, and her name is frequently encountered among the record holders of the world and victors in all-union and international competitions.

Frequently, our parachute girls set world records whose results counted not only for women, but for the men's group.

At the end of 1957, the Soviet Union owned all world records for day and night jumps from the stratosphere and from high altitudes. P. I. Dolgov, Ye. N. Andreyev, V. V. Zuev, V. A. Ruleva, N. K. Nikitin, V. I. Kulish, L. K. Maznichenko, A. A. Alimova, A. V. Vanyarkho, P. F. Ishchenko, N. P. Zhukov, V. K. Petrenko, V. B. Solov'yeva, V. K. Rybalko, A. N. Markova, L. I. Olefirova, E. Yu. Dyagilets, N. M. Shveynova and many others showed themselves to be mature masters in individual and group jumping, with delayed and immediate parachute opening.

The sportsmen learned to accurately determine the time of free fall and strictly maintain jump style, mastered the ability, if necessary, to move away from the target in the area or approach it, change the direction of fall, increase or reduce their speed and perform acrobatic figures in free fall. /476

The parachutists greeted the 30th Anniversary of Soviet mass parachute sport, celebrated in 1960, with enormous successes. Thousands of adolescent boys and girls have joined in parachute sport. In addition to the previously existing aviation clubs and parachute clubs a new form has arisen, born from the initiative of sportsmen, self-help parachute clubs. The self-help club at the Dymer School of Agricultural Mechanization in the Kiev area is well known,

for example, and has prepared hundreds of parachutists in agricultural areas.

On 1 January 1960, Soviet parachutists had established 44 world records out of 61 registered by the FAI. Such a result was not achieved in any other type of sport. It is characteristic to note, that at the beginning of 1960, our young ladies held 50 world records in all types of sports, of which the holders of 24 world records were Soviet parachutists.

In 1953, in Czechoslovakia, Soviet parachutists first encountered their foreign sport friends. In the competitions, teams from Czechoslovakia, Bulgaria and the Soviet Union took part. The parachutists competed in jumps for accuracy of landing, combined and delayed jumps from various altitudes. In all three classes, the lead was held by our sportsmen.

In the next year, parachutists of the USSR entered the Second World Parachute Championship for Parachute Sport in France. The Soviet team took first place. The absolute champion of the world was the Dnepropetrovsk sportsmen I. A. Fedchishin.

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Our sportsmen, entering international competitions, more than once demonstrated the superiority of the Soviet parachute school, the distinguishing characteristics of which are a leading method, a highly developed sense of collectivism, the ability to subordinate the interests of the sportsmen to the interests of the entire team, indurance, high discipline and a striving to increase the sport glory of the motherland.

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The participation by our sportsmen in international competitions in 1957 for the Adriatic Cup, conducted in Yugoslavia, resulted in a glowing triumph for Soviet parachute work. In these competitions, the participants performed in four contests: jumps for accuracy of landing from an altitude of 600 meters, combined jumps with delayed parachute opening of 12-20 seconds (the latter with a score for style of fall), and jumps into water from an altitude of 500 meters for accuracy of landing.

As a result of intense struggle with powerful competitors, the Soviet parachutist N. I. Pryakhin and Yu. M. Peklin became the holders of the Adriatic Cup. /477
Of 30 medals awarded to competitors in these competitions, our sportsmen won 16.

A noteworthy victory crowned the appearance of Soviet parachutists in 1958 in Czechoslovakia, at the Fourth World Championship, where the parachutists of 14 nations demonstrated their art. There Nadezhda Pryakhina won the title of Absolute Ladies World Champion. The Absolute Champion of the World for men was sportsman of the Soviet Army P. F. Ostrovskiy. The Soviet men's and women's teams also took first place.

The on-lookers particularly admired the group jumps by the Soviet parachutists for accuracy of landing from an altitude of 1,500 meters with delayed parachute opening from 15 to 23 seconds. In this competition, Yu. M. Peklin achieved the best results of the championship, landing within seven centimeters of the center of the circle. One of the jumps by repeated record holder engineer

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A. N. Skopinova in this same competition achieved a result of 0.63 meters. From the fourth championship, the Soviet sportsmen brought back to the motherland 14 Gold, Silver and Bronze medals.

At the Fifth Championship, held in Bulgaria, the men's collective of Soviet sportsmen was able to win the honorary designation World Champion Team, first established for the best results in one of the most complex events, group combined jumping for accuracy of landing. A Soviet sportswoman, a foreman in the Minsk Machine Construction Factory, V. M. Zubova, demonstrated high mastery in aerial acrobatics in this championship, performing the established complex of acrobatic figures in 16.4 seconds, and in the second jump in a record time of 15.9 seconds. Taking first place in this event, she was designated Laureate.

Continuing the struggle for distance, altitude, speed and lifting capacity, Soviet pilots convincingly demonstrated high flight technical qualities of the national aircraft and their own mastery.

In 1960, V. K. Kokkinaki set new world records in an Il-18 aircraft for speed of flight on a closed course with various loads. In this same type of flight, I. M. Sukhomlin in a Tu-114 aircraft increased the number of sport achievements of the Soviet Union to 24 world records. The results of sporting activity by the famous test pilot are indicated by the fact that in 1961, he held 32 world records for aircraft sport, of which 13 were won from sportsmen of the USA, and 11 were the first recorded in the tables of the FAI.

On 28 April 1961, G. K. Mosolov set an absolute world record for flight altitude (34,714 meters), and on 7 July 1962, he established an absolute world record for speed (2,681 kilometers per hour). /478

New achievements in breaking world records were recorded in 1961 by pilots N. I. Andriyevskiy and G. I. Bur'yanov, who set 12 world records for speed, altitude and lifting capacity in an M-10 flying boat.

Substantial changes to the world record books were made by pilots P. M. Ostapenko and A. V. Fedotov, and by the crew of the amphibious aircraft Chyka, consisting of M. I. Mikhaylov, Yu. M. Kupriyanov, L. F. Kuznetsov and V. A. Gusev.

The Yak-18p aircraft built by the design collective of A. S. Yakovlev opened new possibilities for sportsmen pilots in the further perfection and development both of direct and reverse pilotage. The high flight technical qualities of the new sport aircraft were unanimously recognized by Soviet and foreign sportsmen.

The participation of our aviators in international competitions and championships for higher pilotage brought new victories to Soviet sports. In the international comradely competitions for air acrobatics which took place in 1963, the sportsmen of seven socialist nations demonstrated their mastery. For number of participants and complexity of program, these competitions were the equal of the world championship. In a difficult struggle, the victory was attained by Soviet sportsmen. Absolute winner was sport master V. I. Loychikov.

First place for women was taken by R. M. Shikhina.

Young ladies have successfully entered the struggle for sporting achievements in jet aircraft. The first woman in our nation to set a world record for jet aircraft was M. L. Popovich, the wife of cosmonaut P. R. Popovich. Flying at an altitude of 5,000 meters, the pilot covered a 100 kilometer closed course with an average speed of 600 kilometers per hour.

The second woman world record setter in light jet aircraft was sportswoman of the Central Air Club of the USSR, sport master G. G. Korchuganova, who flew a 100 kilometer distance with an average speed of 726 kilometers per hour.

On 19 January 1965, R. M. Ilikhina flew a one place sport piloting jet aircraft designed by A. S. Yakovlev over a measured base of 15-25 kilometers at a speed of 750 kilometers per hour.

In 1965 and 1966, the outstanding women's world records for altitude and flight speed in supersonic aircraft were set by sportswomen of the Central Air Club N. A. Prokhanova, L. Ya. Zaytseva and Ye. N. Martova.

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A considerable role in the development of acrobatic piloting and the introduction of women into it was played by the First All-Union Competitions for Acrobatic Piloting among Women. It is well known, that when performing figures of reverse pilotage the pilots body experiences powerful negative gravity. However, the young ladies who participated in the competition demonstrated high mastery and outstanding physical training. /479

Our sports pilots persistently mastered the art of higher pilotage, achieving ever more accurate performance in the known aircraft evolutions in the air, and also creating new pilotage figures. On 9 May 1964, the Kiev sportsmen, sport masters and meritorious trainers of the Ukraine V. M. Voloven' and M. P. Moseychuk worked out and performed for the first time in history on a Yak-18p aircraft a Nesterov loop in the "head to head" position.

A serious test of sporting maturity was passed by Soviet pilots at the Third World Championship for Higher Pilotage, held in 1964 in Spain. In this championship, the best air acrobatic pilots of 11 nations participated. Our team included V. I. Piskunov, V. I. Pochernin, D. A. Teregulov, V. A. Ovsyankin, V. D. Martem'yanov, M. N. Kipsanova, R. M. Shikhina and L. P. Basil'yeva.

In this championship, Soviet sportsmen demonstrated high mastery of aerobatic pilotage. The on-lookers and judges unanimously remarked that the most complex figures were best performed by the sportsmen of our motherland. The Soviet team took overall team first place. It was awarded a Cup in the name of the outstanding Russian pilot P. N. Nesterov, established by the FAI. R. M. Shikhina took first place and L. P. Vasil'yeva took second place among women.

No small contribution to the total competition of sportsmen for growth in quality was made by the helicopter pilots. In sporting rivalry with the helicopter men of other nations, and primarily with the USA, our sportsmen

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demonstrated high qualities of the national helicopters and their own art, particularly in flights for range and altitude with various loads.

On 1 January 1965, 11 world records of 21 established for helicopters belonged to Soviet pilots. Significant victories in helicopter sport were achieved by R. I. Kaprelyan, B. K. Galitskiy and others.

Great successes were achieved at the beginning of 1965 by women pilots Tat'yana Russiyan and Galina Rastorgueva, who flew an Mi-4 helicopter to an altitude of 7,150 meters.

May of 1965 was marked by particularly great achievements in helicopter sport. Pilot V. P. Koloshenko flew an Mi-10 flying crane to an altitude of 7.134 meters with a commercial cargo of 5,175 kilograms on board. And trainee /481
of the V. P. Chkalov Central Air Club of the USSR, G. V. Alferov immediately broke two world records in this same helicopter. He lifted a maximum load of 25,105 kilograms to an altitude greater than 2,000 meters and a commercial load of 25,105 kilograms to an altitude of 2,800 meters.

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The glider stock of sport aviation clubs received a significant augmentation. Designer O. K. Antonov made a number of new gliders for various purposes, including the record high class soaring A-15. Its arrival was immediately marked by several world and all-union records.

A young Design Bureau for aviation sport technology made the new soarers KAI-14 and KAI-19. Our clubs have made wide utilization of the Czechoslovakian teaching-practice gliders "Blanik", on which quite a few world and all-union records have been established.

In the spring of 1964, sportsman P. N. Antonov flew a two-place Blanik from Dnepropetrovsk to Volgograd, a distance of 702.744 kilometers. The record for range of flight to a designated point in multi-place gliders is the object of an intense and sharp struggle among glidermen. The record established in 1940 by gliderman I. Kartashev (495 kilometers) stood for 13 years. Then it was surpassed by the Polish gliderman Yezhi Popel' and our sportsmen V. M. Il'chenko and A. I. Filyushin. And finally, it came to belong to P. N. Antonov. In this time, the distance of the record flight has been increased by more than 50%.

In the summer of 1964, Z. N. Solevey established two world records in a two-place glider for distance of flight in a straight line (619.995 kilometers) and distance of flight to a designated point (the same distance).

O. A. Manofova and V. I. Chuvikov added world records for speed of flight in a glider on a 300 kilometer triangular course to the records for distance, flying 74.314 and 95.562 kilometers per hour respectively.

The growth of sporting results is characteristic for parachute sportsmen also. This has been facilitated by the appearance of the T-2 parachute designed by I. L. Glushkov, V. S. Yeremin and V. A. Vorob'yev, which was the beginning of the development of slotted sport parachutes, widening the capability of sportsmen to steer the canopy.

/480

V. Piskunov (left) and V. Loychikov.

After this, sportsmen received a series of new sport parachutes which were as good as the best foreign models.

A new type of jump is becoming popular, in which the parachutist in free fall make "pyramids", "relays", "spirals", "carrousels" and complex complicated /482
acrobatic figures, requiring high art in steering the body in the air, accurate calculation and superior daring.

In 1954, the best average result for accuracy of landing in the world championship was more than five meters from the center of the circle, but by 1964, landing even within one meter of the center of the target did not ensure victory, and permitted the sportsmen only to take a place among the best ten.

Soviet sportsmen defended the sporting honor of the motherland with merit. At the International Comradely Competitions which took place in 1963 in the German Democratic Republic and Rumania, first places were taken by T. N. Voinova, Ye. V. Tkachenko, O. N. Kazakov, T. P. Shintova, N. M. Degtyareva, F. G. Soldadze, P. V. Sadilov, V. S. Burdukov and V. V. Rayevskiy.

At the Seventh World Championship in 1964, which took place in the Federal Republic of Germany, our parachutists took first place in a number of events. The women's world champion for accuracy of landing in jumps was once again V. M. Seliverstova, one of the outstanding parachutists of the world. More than 20 years ago, she made her first jumps in the Omsk Air Club. The thoroughly developed sportswoman skied well, rode horseback, was occupied with light athletics, swam and dove. The Siberian woman loved many types of sport, but none of them could she compare with parachute jumping.

V. Seliverstova

At the air club, Valya became friendly with glider man Nikolay Mefod'yev, who, to please his girl friend, also took up parachute sport and quickly became an instructor. They jumped together. They rejoiced in the success and grieved with failures. The sport friends became man and wife. A son was born to them. Naturally, Valentina had to stop jumping. Her count at that time was 80. At this time, her husband perished testing a parachute. The loss of her beloved man had a heavy effect on Valentina's life. She was left alone with her young son and aged mother. She was prohibited from jumping. /483

But several years passed, and, overcoming many barriers, Seliverstova made her 81 jump. It was a triumph, a joy of victory. She experienced a feeling like that of people who lose their sight and then regain it. "I will now make twice as many jumps", Valentina then decided.

With each year, the unusual talent of the sportswoman unfolded more. She won one victory after another in various competitions.

The name of Seliverstova was recorded 18 times in the tables of all-union and world aviation records. She had more than 2,000 jumps.

No woman in the world has descended from the sky so many times beneath the slit canopy of a parachute.

The Soviet government highly appreciated the achievements of meritorious sport master V. M. Seliverstova, awarding her the Order of Labor of the Red Banner, and the Red Star, and a medal for Labor Valor.

A new state for parachutists on the path to the peak of mastery is the air relay, performed in free fall with subsequent opening of the parachute. In this type of jump, high results were achieved by the sports couple S. A. Kiselev and I. B. Solov'yeva. For the championship of DOSAAF in 1966, they required only 5.4 seconds after leaving the aircraft to come together in the air and pass the baton from hand to hand.

The names of sport masters Colonel P. I. Dolgov and Major Ye. N. Andreyev have entered the annals of world parachute work. They were given the mission of carrying out a number of scientific investigations while jumping from the stratosphere.

The sports account of P. I. Dolgov included 1,408 jumps and eight world and all-union records, including the one-man world records established in 1960 for a night jump with immediately opened parachute from an altitude of 12,974 meters and a day jump from an altitude of 14,835 meters.

Ye. N. Andreyev set more than one record for the nation and the world, and had experience jumping from the stratosphere.

On 1 November 1962, the parachutist went up in a balloon to an altitude of over 25,000 meters. P. I. Dolgov perished in the jump, perished in the name of science. Ye. N. Andreyev, making a delayed jump, successfully completed it. Andreyev's free fall lasted 270 seconds. During this time, the parachutist fell 24,500 meters; he opened his canopy only at an altitude of 958 meters. Andreyev established a new world record for a jump from the stratosphere with delayed parachute opening.

By an order of the Presidium of the Supreme Soviet of the USSR, P. I. Dolgov land Ye. N. Andreyev were awarded the designation Hero of the Soviet Union for their exemplary fulfillment of the mission in testing new aviation lifesaving means and for the bravery, daring and heroism displayed in this. At the beginning of 1967, Soviet parachutists had 81 of 124 registered world records. The count of sporting achievements by our sportsmen grows steadily: in April of 1967, Soviet parachutists made new serious changes to the record books of the FAI, setting 43 more world records in jumps for accuracy of landing. /484

In our nation, favorable conditions have been set up for the vigorous progress of mass aviation model sport. Beginning in 1923, every where in the city and in the country, in schools, clubs and pioneer detachments, aviation model circles are set up, conducting mass competitions for flying models.

During this time, aviation modelling has come a long way. At the present time, it involves hundreds of thousands of children, juveniles and youth. In clubs, pioneer palaces, schools, children's technical stations and aviation model laboratories there is animated creative activity by young designers. Aviation modelling has become one of the recognized, highly effective means of polytechnization of the schools.

The achievements of the Soviet people in rocket construction and mastering the cosmos have created a burning desire in boys to construct model rockets. In

the nation, the network of model rocket circles grows, clubs are set up for junior cosmonauts, and there is a competition every year for young rocket constructors. The model cosmic ships fly ever higher into the sky.

Soviet sportsmen hold a considerable number of world records in classes of model aircraft, seaplanes and helicopters with rubber band and piston motors, for radio controlled and line controlled models and others.

Our aviation modellers V. N. Matveyev, A. I. Zolotoverkh, E. V. Kobets, I. D. Radchenko, A. N. Babichev, Yu. A. Sirotkin, B. D. Shkurskiy, V. N. Simonov, K. A. Plotsin' and B. N. Krasnorutskiy, have several times won prizes and absolute victories in international competitions. Thus, in 1963 at the championship of Europe for Line Models, the Soviet team won three out of four transitory cups. Outstanding sporting results were achieved at the All-Union Competitions for Aviation Models. The Soviet aviation modellers persistently improved their technical mastery, multiplying world and all-union records.

In 1961, a new type of sport appeared, a regular development of aviation sport, cosmic sport. The first flight of a man in the cosmos, made on 12 April 1961 by a citizen of the USSR, communist Yu. A. Gagarin, was the first world cosmic record. Since then, the International Aviation Federation has augmented its lists of world records by the appropriate divisions and begun to register achievements in human flight in cosmic ships. On 1 January 1965, the cosmonauts of the Soviet Union held all absolute cosmic records, and also all world records for the class of orbiting flights on single-plane and multi-place cosmic ships. /485

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Aviation sportsmen take pride in the fact that four heroes of cosmos came from their ranks: Yu. A. Gagarin made his first flights in an airplane in the Saratov air club; P. R. Popovich -- in the Magnitogorsk branch of the Chelyabinsk air club; V. F. Bykovskiy -- in the Moscow club, and the first woman cosmonaut, V. V. Tereshkova-Nikolayeva was a parachutist in the Yaroslav air club.

Addressing the aviation sportsmen, cosmonaut P. R. Popovich, "We cosmonauts follow attentively the successes of our air sportsmen and take pride in the fact that they hold the majority of world aviation records. Many aviation sportsmen from the air clubs go on to major aviation, becoming skillful and daring pilots... The path to the cosmos is through aviation."

In 1961, aviation sportsmen took part in a great aviation holiday at the Tushino Airfield in honor of Air Fleet Day. Together with military pilots and airborne troops, the pilots of civil aviation and workers in the aviation industry, they so to speak rendered an account before the Soviet people, demonstrating their sporting achievements.

The air holiday opened with the flight of 44 sport aircraft, whose formation spelled out in the sky a name dear to every worker, Lenin. The group of aircraft was led by sport master record holder V. Ye. Shumilov.

Before the sport aviation section of the holiday, the speaker told the

on-lookers that at the beginning of 1961, Soviet aviation sportsmen were the holders of 182 world records out of 412 registered by the FAI. In addition, on Air Fleet Day in 1961, our sportsmen established 19 all-union records, 14 of which exceeded the official world achievements. The general admiration of the on-lookers was attracted by the performance of pilotage complexes by a group consisting of 12 glidermen, the "head to head" flight of sportsmen from the Kiev and Minsk air clubs V. M. Voloven' and V. A. Ovsyankin, the inverted flight in a Yak-18p aircraft, and the flight of a group of 21 aircraft. The young ladies received a stormy ovation for their elegant and accurate work in the air. The women pilots performed a complicated pilotage complex beautifully in Yak-18a aircraft. /486

Sportsmen demonstrated their mastery in group jumps with 20 second delayed parachute opening. The acrobatic "pyramid" jumps particularly pleased the on-lookers. Two trios of sportsmen: mens, A. A. Kryukov, P. K. Voylenko, Ye. A. Podgorbunskiy, and womens, L. F. Akimova, M. A. Solodushenkova and A. N. Skopinova, left the aircraft holding hands. In this position, they rushed towards the ground. Judging the time accurately, the parachutists continued their free fall, then separated and opened their parachutes.

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Among those who flew sport aircraft and gliders and made parachute jumps, there were mechanics, lathe operators, machinists, dress makers, artists, technicians, performers and students. The varying professions of those who spend their spare time on aviation sport indicate its general availability for wide masses of laborers. For successes in aviation sport and participation in the air parade, a large group of aviation sportsmen was awarded orders and medals.

Significant manifestations of youthful initiative are the competitions on technical types of sport, systematically conducted by DOSAAF together with the komsomol. Thus, in 1958, there was a competition connected with the 40th Anniversary of the Leninist komsomol, which attracted new enormous streams of youth to the aviation clubs and circles. In the Second All-Union Competition on Technical Types of Sport (1961) 190,000 aviation sportsmen took part.

A significant landmark in the development of military technical types of sport, including aviation sport, was the Fifth All-Union Conference of the All-Union Order of the Red Banner Volunteer Society for the Support of the Army, Aviation and Fleet. In welcoming the congress and all members of DOSAAF, the Central Committee of the Party stated, "The Central Committee of the Communist Party of the Soviet Union highly appreciates the merits of the voluntary society, uniting in its ranks tens of millions of Soviet toilers, in the military patriotic education of workers, the active support of youth training for service in the Army and the development of applied military and technical types of sport. Many famous aviation designers and fearless pilots received training and tempering in the circles and clubs of DOSAAF, and daring sportsmen grew up in the ranks of the society, winning many world aviation records for our motherland."

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The Fifth Congress of the Defense Society addressed the sportsmen, social instructors, trainers and judges, all the members of DOSAAF, with a call for

surpassing new boundaries, multiplying the quantity of world records and raising the glory of Soviet sport even higher in the next few years. Inspired by the high appraisal given by the Central Committee of the Communist Party of the Soviet Union to aviation sport, the sportsmen will respond to the concern of their own native party with new patriotic actions. /487

On 1 January 1967, the aviation sportsmen of our motherland held 253 records of 650 registered by the FAI. New victories were achieved by the appearance of Soviet aviation sportsmen in world championships and international competitions.

The appearance of our sportsmen at the Fourth World Championship for higher pilotage, conducted in Moscow in 1966, was a triumph for the nation's aircraft sport.

The best aces of the world assembled for the championship. The national flags of 15 countries flew above the Tushino Airfield. In three semi-final events, the Soviet men's team consisting of V. D. Martem'yanov, V. A. Ovsyankin, V. I. Piskunov, V. I. Pochernin and A. P. Pimenov won the grand prize of the FAI, the P. N. Nesterov Cup, with a significant advantage over their competitors.

All three places on the pedestal of honor were occupied by Soviet young women, the victors in the individual competition. The absolute women's champion of the world for higher pilotage was engineer G. G. Kopchuganova, the silver medalist of the championship was pilot instructor of an aviation sport club T. V. Peresekina, and the bronze winner was M. N. Kirsanova, pilot instructor at the Central Air Club of the USSR.

Eighteen pilot acrobats who had achieved the best results entered the final. Two more complexes, and the absolute champion of the world for higher pilotage was V. D. Martem'yanov, a pilot instructor at an aviation sport club. The second and third places were taken by V. A. Ovsyankin, the commander of an An-2 aircraft crew in the Belorussian administration of civil aviation, and Air Force Officer V. I. Piskunov.

Twenty four medals and 16 cups were the sporting achievements of our pilot acrobats at this championship.

In the same year, the Eighth World Championship for Parachute Sport was held in Leipzig (German Democratic Republic), in which 18 nations participated.

The honor of Soviet parachute sport in this representative competition was defended by the best parachutists in the world: the women's team, V. M. Seliverstova, L. M. Yeremina, T. N. Voinova, A. V. Khmel'nitskaya and M. P. Kostina; the men's team, O. N. Kazakov, Ye. V. Tkachenko, V. S. Burdukov, V. B. Gurnyy and V. S. Krest'yannikov.

In sharp and difficult struggle, the team first place was won by our parachutists, who were prepared for the responsible encounter by a meritorious

trainer of the USSR P. Storchienko. The Soviet sportsmen won 41 medals, including 25 gold (out of 26), and all six medals of the FAI for the first three places in individual multiple event competition. /488

The absolute champions of the world for parachute sport were: among the women, a technician from Barnaul, Lidiya Yeremina, and among men, Master Sergeant of the Soviet Army Vladislav Krest'yannikov.

The history of parachute sport has never known such a convincing victory.

Soviet sportsmen make a great contribution to the development of aviation sport throughout the world. They have a significant influence on the development of sport in other nations. Thus, the parachutists of many nations have borrowed the method first developed by us of controlling the body in free fall, the technique of performing acrobatic figures in the air, the methods of steering the canopy of a parachute and so forth.

The various complexes of figures for single and group higher pilotage created by Soviet pilots have entered the program of championships, international competitions in aircraft sport and demonstration appearances at various holidays and solemn occasions.

The creative efforts and labors of many Soviet workers and cosmonautics and aviation science and technology, pilots and aviation sportsmen have been noted by awards from the International Aviation Federation. Great gold medals of the FAI were awarded to the outstanding designer A. N. Tupolev and the first cosmonaut in the world Yuriy Gagarin. V. Tereshkova-Nikolayeva was awarded the "Cosmos" gold medal of the FAI. V. Bykovskiy was awarded the de la Veau medal.

On a suggestion from the Federation of Aviation Sport of the USSR, in 1962 the FAI established a cup in the name of the outstanding Russian pilot P. N. Nesterov. This transitory prize is awarded to the world championship team in higher pilotage.

The successes of our aviation sport and its leading place in the international arena are due to the fact that the Communist Party and Soviet government are constantly concerned with the well rounded development of the younger generation, with the education of the new man, harmonously combining spiritual wealth and physical perfection.

Soviet youth, continuing the glorious traditions of older generations, strives for the sky. And the motherland lovingly helps its sons and daughters find wings. In the nation, a wide net of aviation clubs has developed, well equipped with various aviation technology, sport aircraft, including jets, helicopters, gliders of various types, parachutes and various kinds of training apparatus. The aviation clubs have well equipped airfields and training areas. /489 The activities of the sportsmen are led by experienced instructors and lecturers.

Aviation sport helps to develop in the youth the high morale and physical

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qualities necessary for productive labor and the defense of the motherland.

More and more young men and women are coming to aviation sport. They enthusiastically master the art of piloting aircraft, helicopters and gliders, parachute jumping and model building. By their patriotic actions, the young people strive to increase the glory of the great aviation empire, our beloved motherland.

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CONCLUSION

The first workers state in the world, the Union of Soviet Socialist Republics, has existed for half a century. In its relatively short history, the new type of state achieved grandisse successes in all areas of internal and international life. /490

The Soviet Union converted itself from an agrarian, semi-feudal nation like Tsarist Russia to a nation with a highly developed economy. The socialist system has obviously demonstrated its advantage over the rotten and moribund system of capitalism.

Our nation is at the head of all democratic forces. Together with her, a bright future is being built by a number of states, united under the banners of Marxism-Leninism in the camp of socialism. The USSR is leading humanity on the path of progress.

A visible indication of the significant achievements of the Soviet Union and a clear demonstration of the superiority of the socialist order is the founding and vigorous growth of the air fleet of the Soviet state. Aviation embodies the latest achievements of science and technology. The very existence of a powerful air fleet indicates the high level of economic development of the Soviet nation.

Before 1917, the aviation of Tsarist Russia dragged on a pitiful existence. There was practically no aviation industry in the nation. The scientific technical base was very poor. The stagnant bureaucratic apparatus of the landlords and capitalist state did not take the necessary measures for the development of the national air fleet. Even the experience of the First World War, a convincing demonstration of the great military significance of aviation, was not considered to the necessary degree by the Tsarist government. Russia continued to lag ever farther behind the other capitalist states in the development of air forces. The brilliant labors of scientists and inventors, the heroic efforts of Russian people striving to set up aviation in the fatherland, were wasted. /491

With the victory of the Great October Socialist Revolution, the development of aviation started a new path.

In the Soviet nation, talented scientists, noteworthy designers, good production organizers were developed. The motherland did not spare the means for the development of scientific centers and Design Bureaus. Soviet people are rightfully proud of the world famous achievements of our aircraft construction schools. In an unprecedented short time, aviation industry was founded in the nation, mastering the mass production of the most perfect combat machines and high lift capacity airliners.

The development of aviation would have been impossible without the well coordinated work of many branches of the national economy. High quality steels, novel electronic and automatic devices, synthetic materials -- all technological improvements are immediately used in aircraft construction.

And the amount of fuel required to put the many thousands of aircraft of our nation into the air! It means that Soviet oilmen contributed and are contributing no small share to the development of the air fleet.

We must not forget that for normal operation, aviation needs well equipped airfields and airports. Their construction is a substantial contribution by the Soviet people to the founding of the air forces.

Only well trained, technically prepared cadres can skillfully use contemporary aviation technology. In short periods of time, a network of middle and higher aviation educational establishments was developed. Soviet pilots, navigators, gunners-radio men, engineers and technicians outstandingly mastered their equipment. They amazed the whole world by their bravery and masterful handling of first class aircraft. In peacetime and in the war years, experienced Soviet aviators devotedly served the motherland.

All work in establishing Soviet aviation took place and takes place under the wise supervision of the Communist Party. Even in 1917, our Party demonstrated great concern for the future air fleet of the nation of Soviets. Headed by the great Lenin, communists conducted a struggle for the conversion of aviation detachments to the side of the revolution. During the difficult conditions of the collapse, foreign military interventions and civil war, they were able to organize the first chast's of Soviet aviation.

Lenin and the Party determined the overall direction for construction of the air fleet of the Soviet Republic. Lenin's insight and brilliant foresight /492
helped our aviation to take a worthy place in the system of armed forces and the national economy of our nation.

Obedient to Lenin's testiment, the Party gave great attention to the development of aviation in peacetime. The establishment of the aviation industry, the development of cadres, the construction of airfields, all of the basic measures for the improvement of the air fleet were taken on the basis of special decisions of the Party and its Central Committee.

In the days of the Second World War, the Party led all the activities of Soviet people at the front and in the rear. It gave great attention to the construction of aircraft and the supervision of combat activities by the military air forces.

In the post-war years, the Central Committee of the Communist Party of the Soviet Union took a number of decisions permeated with concern for the fortunes of the air fleet of the USSR. All the most important questions in the development of military and civil aviation are within the field of vision of the Communist Party. In the guidance of the Party, we see a warrant of new successes for Soviet pilots.

In response to the concern of the Party and for love of the Soviet people, those with wings will faithfully serve the business of the revolution, bravely defending the conquests of the Great October. Our aviators have always been in the first ranks of defenders of the motherland.

In the first years of Soviet power, on antiquated, shabby aircraft, they stuggled against the interventionists and white guardsmen, contemptuous of death. Their exact bombing strikes, accurate reconnaissance information, unrestrained struggle with the air enemy and daring communications flights greatly helped to defend the young Soviet Republic.

The Soviet pilots participated in the suppression of centers of counter revolution, in the struggle with counterrevolutionary bandits in Central Asia. Our government and military command, deeply trusting their indurance and total commitment to the business of the revolution, have always assigned aviation the most responsible missions.

In the 30's, our military air forces began to defend the Soviet state with terrible weapons. They acquired significance as an important operational strategic factor. Under the circumstances of a growing threat of a new world war, the power of the military air fleet of the nation of Soviets restrained the aggressive striving of the imperialists, forcing the capitalist states in all international affairs to give ever more consideration to the opinion of the Soviet Union.

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And when the imperialists tried to "probe" the forces of our nation at the Island of Khasan, on the Khalkhin-Gol River and at the Karelian Isthmus, they received a worthy rebuff from the Soviet armed forces, and in particular, the military air fleet. The aviators, striking efficient blows, paralyzed the actions of enemy pilots. They destroyed the enemy ground troops. /493

Successful activities by Soviet military air forces were one of the basic causes for the swift destruction of enemies of the Soviet Union in the armed conflicts which took place on the eve of the Second World War.

The noteworthy mobile properties of aviation permitted it to take part in the battles in Spain. Our pilots, burning with the desire to help the Spanish people liberate itself from the chains of imperialistic slavery, voluntarily went to battle the fascist in the skies of Catalonia and Madrid. They struck the Japanese imperialists in Central China. The rich traditions of internationalism and the revolutionary solidarity of labor keep the heroic deeds of our aviation in their annals.

When the Second World War broke out, Soviet pilots were in the front ranks of defenders of the socialist fatherland. In the unbelievably difficult conditions of the summer and fall of 1941, they found within themselves the strength and bravery to struggle with the dangerous enemy. The heroic deeds of pilots defending the Baltic Republic and Belorussia, the Ukraine and Moldavia, Leningrad, Moscow, Kiev, Odessa, Sevastopol', Stalingrad and other cities of

our nation, form one of the brightest pages in the history of the Second World War.

The fascist invaders tried by blows from the air to destroy the basic military industrial centers of the nation, wiping Mocow and Leningrad from the face of the earth. However, the plans of the enemy were disrupted. Soviet fighter pilots beat off the attacks of enemy aviation on peaceful Soviet cities.

Annihilating two thirds of German fascist aviation, the Soviet military air forces not only earned strategic mastery in the air over the Soviet-German front, but also carried decisive destruction to all the air forces of the fascist coalition.

Our aviators caused enormous destruction to the ground troops and fleet of the enemy. Thousands of tanks and trucks, great quantities of artillery arms and other military technology, were annihilated by bombs and shells from the military air forces. And what massive morale effect on enemy troops was demonstrated by mass strikes of our aviation! Fifth percent of the fleet lost by the fascist on the North, Baltic and Black Seas, was lost to Soviet aviation.

The Soviet people worthily noticed the contribution of the military air forces to victory. Aviation is represented by 2,420 Heroes of the Soviet Union, 65 two time winners and two three time winners. 60% of the aviation /494
chast's were decorated with orders and medals.

In the post-war years, Soviet aviators alertly guard the peaceful labors of the Soviet people. They are always ready to oppose the air cosmic nuclear forces of imperialist aggressors with all the power of Soviet aviation, equipped with the most improved technology.

Aviators were the first to storm the cosmos. Their fearlessness excites the admiration of peoples all over the world. The successes of the Soviet Union in mastering cosmic flights are generally accepted. The first orbital cosmic flight and the first exit of a Soviet man from a cosmic ship in space became noteworthy events in world history.

Pilot cosmonauts confidently break new trails in the universe. And the day is not far off when Soviet cosmic ships will fly to new worlds.

Our achievements in astronautics would be unthinkable without the persistent labor and struggle of thousands of Soviet aviators, building the roads to the heights above the clouds, The successes of the USSR in mastering cosmic flights were prepared by all the heroic history of Soviet aviation.

The role of aviation in the national economy is great. It began to be applied as a means of transport and communications even in the first years of Soviet power. Even then, V. I. Lenin pointed out the necessity for wide development of civil aviation in our nation.

The area of application of the air fleet in the national economy grew uninterruptedly. The search for schools of fish and the struggle with forest

fires, rescue work and the assembly of various metal constructions became unthinkable without the participation of aircraft and helicopters.

And how quickly the volume of transport of people and various urgent cargoes by the Civil Air Fleet grew!

Aviation transport became a serious competitor for railroad transport, without mentioning automobile and river transport. And it is no accident that the Supreme Soviet of the USSR decided to set up a Ministry of Civil Aviation.

With the development of military and civil aviation in our nation, such forms of aviation sport as air modelling and glider work, parachute and aircraft sport received wide acceptance.

Aviation sport develops the best qualities of the human character. It inculcates bravery, tempers the will and teaches daring. Physical strength and spiritual nerve are the characteristic marks of the aviation sportsmen.

The air clubs of our nation are preparing a worthy replacement for the aviators of the older generation. Here the young men and women master aviation / 195
knowledge and learn the art of flight. And who knows, it may be that some one of them will be able to reach the peak of flight mastery and become a test pilot, and another will have the fortune to master cosmic space!

Aviation has firmly entered the life and habits of Soviet people. The wonder of the 20th Century has ceased to be a wonder. Many of our fellow citizens perfer the aircraft to the railroad car. Others are themselves learning to operate a fast winged machine. There are ever fewer people who have not experienced the sensation of flight.

The Soviet Union has become a great aviation empire. On the path towards conquering the altitudes above the clouds, the Soviet people achieved significant successes. These successes did not come of themselves. They were won by persistent labor in effortful struggle.

The achievements of our nation are great on the path to constructing the communist society. "From the peak of the 50th Anniversary of the October Revolution", states the thesis of the Central Committee of the Communist Party of the Soviet Union on the 50th Anniversary of the Great October Socialist Revolution, "the Party and Soviet people comprehend the path they have travelled, in order to better solve new problems. The revolutionary business, begun by the Great October Socialist Revolution, will be widened and strengthened, and will be victorious."[1]

The history of Soviet aviation is instructive. It clearly illustrates the

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[1] *50 let Velikoy Oktyabr'skoy sotsialisticheskoy revolyutsii. Tezis' TsK KPSS*, [50 years of the Great October Socialist Revolution. Thesis of the Central Committee of the Communist Party of the Soviet Union], Politizdat Press, p. 5, 1967.

path and method of establishment in the socialist state of a new progressive means of defense and transport. The methods of construction the air fleet of the USSR can be widely utilized in establishing newly arising future branches of economics and organizing work to master new means of armed struggle.

History teaches that no great empire can exist without powerful aviation. Only with military air forces well equipped with the newest technology can there be an effective performance in the mission of defending the motherland from the infringements of its enemies. Only with powerful civil aviation can the problems of transport communications between outlying regions of our unbounded nation be solved.

Aviation is a complex and technologically highly equipped organism. The process of its construction proceeds on a basis of achievements in all areas of science and technology. Building new models of aircraft and training qualified cadres requires substantial amounts of time. In this, the entire development process must go uninterruptedly. Only in this case is it possible to expect good results.

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In the development of aviation, there can be no place for voluntarism and insufficiently founded decisions. Only an accurate general line and long range planning in the area of developing military and civil aviation will ensure success. /496

The grandisse achievements in the construction of Soviet aviation are based first of all on the fact that the Communist Party demonstrated and demonstrates tireless concern for the strengthening of the air fleet of the Soviet state. It has conducted an enormous development work among the pilots and navigators, engineers and technicians. High idealism and consciousness, and the noteworthy morale qualities of our aviators have served, are serving and will serve the business of strengthening the air fleet of the USSR.

Soviet aviation is on a new ascending curve. The newly constructed supersonic rocket carrying aircraft will serve as a reliable means of defending the air spaces of our nation. Ever newer heavy lift airliners are arriving on the routes of the Civil Air Fleet. Their speed also has exceeded the speed of sound, and their lifting capacity has reached the tens of tons. They can take 700 to 800 passengers on board.

The Soviet Union will firmly maintain the lead in mastering cosmic space. Improved cosmic ships and automatic stations will plow the spaces of the universe. Ever newer ships will fly the cosmos.

The space of the human empire is unlimited. In aviation, even the boldest dream cannot be considered unattainable. New discoveries, new successes in the development of aviation and astronautics await the Soviet people.

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World Record Holder T. Russiyan in the Cabin of a Helicopter. 1935.

Parachute Woman N. Pryakhina

Sport Master Ye. Tkachenko

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Absolute World Champions for Higher Pilotage, G. Korchuganova and V. Martem'yanov. 1966.

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The Team Winners in the Fourth World Championship for Higher Pilotage (left to right): A. Pimenov, V. Ovsyankin, V. Piskunov, V. Martem'yanov and V. Pochernin. 1966.

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1. Aviators -- Heroes of the Soviet Union[1]

/497

Three Time Heroes of the Soviet Union

KOZHEDUB, I. N.	2/4/44	Senior Lieutenant, Squadron Commander of the 240th Fighter Regiment
	8/19/44	Captain, Deputy Commander of the 176th Guards Fighter Regiment
	8/18/45	Major, Deputy Commander of the 176th Guards Fighter Regiment
POKRYSHKIN, A. I.	5/24/43	Captain, Squadron Commander, 16th Guards Fighter Regiment
	8/24/43	Major, Squadron Commander, 16th Guards Fighter Regiment
	8/19/44	Lieutenant Colonel, Commander of the 9th Guards Fighter Regiment

Two Time Heroes of the Soviet Union

ALEKSENKO, V. A.	4/19/45	Captain, Squadron Commander, 15th Guards Ground Attack Regiment
	6/29/45	Major, Deputy Commander of the 15th Guards Ground Attack Regiment
ALELYUKHIN, A. V.	8/24/43	Captain, Squadron Commander, 9th Guards Fighter Regiment

[1] In the lists of recipients are: three time Heroes of the Soviet Union -- two people; two time Heroes of the Soviet Union -- 71 people; Heroes of the Soviet Union -- 2,711 people; holders of the Order of Glory First Step -- 49 people.
The list of aviators -- Heroes of the Soviet Union was compiled on the basis of decoration records kept in the Archives of the Ministry of Defense USSR; the card indices of the main Personnel Directorate of the Ministry of Defense USSR; and the Personnel Directorate of the VVS (Air Force).
The list shows the dates of the decrees of the Presidium of the Supreme Soviet USSR conferring the Rank of Hero of the Soviet Union on the aviators for the period from 1934 through 1966 and also the recipient's military rank, duties and military units during the Second World War.

	11/1/43	Captain, Squadron Commander, 9th Guards Fighter Regiment
AMET-KHAN SULTAN	8/24/43	Captain, Squadron Commander, 9th Guards Fighter Regiment
	6/29/45	Major, Deputy Commander for Air Forces 9th Guards Fighter Regiment
ANDRIANOV, V. I.	7/1/44	Junior Lieutenant, Flight Commander, 667th Ground Attack Regiment
	6/27/45	Captain, Squadron Commander, 141st First Guards Ground Attack Regiment
BEGEL'DINOV, T. YA.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 144th Guards Ground Attack Regiment /498
	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 144th Guards Ground Attack Regiment
BEDA, L. I.	10/26/44	Senior Lieutenant, Squadron Commander, 75th Guards Ground Attack Regiment
	6/29/45	Major, Deputy Commander, 75th Guards Ground Attack Regiment of the Aerial Gunnery Service
BONDARENKO, M. A.	6/6/42	Lieutenant, Squadron Commander, 198th Ground Attack Regiment
	8/24/43	Major, Squadron Commander, 198th Ground Attack Regiment
BOROVYKH, A. YE.	8/24/43	Junior Lieutenant, Flight Commander, 157th Fighter Regiment
	2/23/45	Captain, Squadron Commander, 157th Fighter Regiment
BRANDYS, A. YA.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 75th Guards Ground Attack Regiment
	6/29/45	Captain, Squadron Commander, 75th Guards Ground Attack Regiment
VOROB'YEV, I. A.	8/19/44	Senior Lieutenant, Deputy Squadron Commander, 76th Guards Ground Attack Regiment
	6/29/45	Major, Squadron Commander, 76th Guards Ground Attack Regiment

VOROZHEYKIN, A. V.	2/4/44	Captain, Squadron Commander, 728th Fighter Regiment
	8/19/44	Major, Deputy Commander, 32nd Guards Fighter Regiment
GAREYEV, M. G.	2/23/45	Captain, Squadron Commander, 76th Guards Ground Attack Regiment
	4/19/45	Major, Squadron Commander, 76th Guards Ground Attack Regiment
GLINKA, D. B.	4/21/43	Senior Lieutenant, Chief of the Aerial Gunnery Service of the 45th Fighter Regiment
	8/24/43	Captain, Deputy Commander of the 100th Guards Fighter Regiment for the Aerial Gunnery Service
GOLOVACHEV, P. YA.	11/1/43	Senior Lieutenant, Flight Commander, 9th Guards Fighter Regiment
	6/29/45	Captain, Deputy Squadron Commander, 9th Guards Fighter Regiment
GOLUBEV, V. M.	8/12/42	Senior Lieutenant, Flight Commander, 285th Ground Attack Regiment
	8/24/43	Captain, Squadron Commander, 285th Ground Attack Regiment
GRITSEVETS, S. I.	2/22/39	Lieutenant, Fighter Pilot
	8/29/39	Major, Commander of a group of fighters
GULAYEV, N. D.	9/28/43	Senior Lieutenant, Deputy Squadron Commander, 27th Fighter Regiment
	7/1/44	Captain, Squadron Commander, 129th Guards Fighter Regiment
DENISOV, S. P.	7/4/37	Senior Lieutenant, Detachment Commander
	3/21/40	Division Commander, Commander of the 56th Aerial Brigade
YEVSTIGNEYEV, K. A.	8/2/44	Senior Lieutenant, Squadron Commander, 240th Fighter Regiment
	2/23/45	Captain, Squadron Commander, 178th Guards Fighter Regiment

Page One Title
Cover Page Title
Cover Page Source
NASA

YEFIMOV, A. N.	10/26/44	Senior Lieutenant, Squadron Commander, 198th Ground Attack Regiment /499
	8/18/45	Captain, Navigator for the 62nd Ground Attack Regiment
YEFREMOV, V. S.	5/1/43	Captain, Squadron Commander, 10th Guards Bomber Regiment
	8/24/43	Major, Squadron Commander, 10th Guards Bomber Regiment
ZAYTSEV, V. A.	5/5/42	Major, Navigator for the 5th Guards Fighter Regiment
	8/24/43	Lieutenant Colonel, Navigator for the 5th Guards Fighter Regiment
KAMOZIN, P. M.	5/1/43	Junior Lieutenant, Flight Commander, 269th Fighter Regiment
	7/1/44	Captain, Deputy Squadron Commander, 269th Fighter Regiment
KARPOV, A. T.	9/28/43	Captain, Squadron Commander, 27th Guards Fighter Regiment (4")
	8/22/44	Captain, Squadron Commander, 27th Guards Fighter Regiment
KLUBOV, A. F.	4/13/44	Senior Lieutenant, Deputy Squadron Commander, 16th Guards Fighter Regiment
	6/27/45	Captain, Deputy Commander for Aerial Gunnery Service, 16th Guards Fighter Regiment
KOKKINAKI, V. K.	7/17/38	Test pilot
		General Major
KOLDUNOV, A. I.	8/2/44	Captain, Squadron Commander, 866th Fighter Regiment
	2/23/48	Captain, Squadron Commander, 866th Fighter Regiment
KOMAROV, V. M.	10/19/64	Colonel, Engineer, Commander of the Spacecraft "Voskhod"
	4/24/67	Colonel, Engineer, Cosmonaut, Commander of the craft "Soyuz-1"

Page One Title
Cover Page Title
Cover Page Source
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KRAVCHENKO, G. P.	2/22/39	Major, Commander of an Air Detachment
	8/29/39	Major, Commander of the 22nd Fighter Regiment
KRETOV, S. I.	3/13/44	Captain, Flier in the 240th Guards Bomber Regiment
	2/23/48	Captain, Squadron Commander, 24th Air Regiment of Long-Range Aviation
KUZNETSOV, M. V.	9/8/43	Major, Squadron Commander, 14th Reserve Air Regiment
	6/27/45	Major, Commander of the 106th Guards Fighter Regiment
KUNGURTSEV, YE. M.	2/23/45	Senior Lieutenant, Flight Commander for the 15th Guards Ground Attack Regiment
	4/19/45	Senior Lieutenant, Squadron Commander, 15th Guards Ground Attack Regiment
LAVRINENKOV, V. D.	5/1/43	Junior Lieutenant, Deputy Squadron Commander, 9th Guards Fighter Regiment
	7/1/44	Major, Squadron Commander, 9th Guards Fighter Regiment
LUGANSKIY, S. D.	9/2/43	Captain, Squadron Commander, 270th Fighter Regiment
	7/1/44	Major, Squadron Commander, 270th Fighter Regiment
MAZURENKO, A. YE.	10/23/42	Junior Lieutenant, Pilot for the 57th Air Regiment of the Air Forces of the Red Banner Baltic Fleet
	11/5/44	Captain, Commander of the 7th Guards Ground Attack Regiment for the Air Forces of the Red Banner Baltic Fleet
MIKHAYLICHENKO, N. KH.	7/1/44	Lieutenant, Flier in the 667th Ground Attack Regiment
	6/27/45	Senior Lieutenant, Squadron Commander, 141st Guards Ground Attack Regiment
MOLODCHIY, A. I.	10/22/41	Junior Lieutenant, Aircraft Commander for Air Regiment of Long-Range Aviation

	12/31/42	Captain, Deputy Squadron Commander, 2nd Guards Air Regiment for Long-Range Aviation	/500
MYL'NIKOV, G. M.	2/23/45	Captain, Squadron Commander, 15th Guards Ground Attack Regiment	
	4/19/45	Major, Squadron Commander, 15th Guards Ground Attack Regiment	
MYKHLIK, V. I.	2/23/45	Senior Lieutenant, Squadron Commander, 566th Ground Attack Regiment	
	6/29/45	Captain, Squadron Commander, 566th Ground Attack Regiment	
NEDBAYLO, A. K.	4/19/45	Senior Lieutenant, Deputy Squadron Commander, 75th Guards Ground Attack Regiment	
	6/29/45	Senior Lieutenant, Squadron Commander, 75th Guards Ground Attack Regiment	
NOVIKOV, A. A.	4/17/45	Chief Marshal of Aviation, Commander of the Air Forces	
	9/8/45	Chief Marshal of Aviation, Commander of the Air Forces	
ODINTSOV, M. P.	2/4/44	Senior Lieutenant, Squadron Commander, 820th Ground Attack Regiment	
	6/27/45	Deputy Commander of the 155th Guards Ground Attack Regiment	
OSIPOV, V. N.	6/20/42	Senior Lieutenant, Pilot 31st Air Regiment Long-Range Aviation	
	3/13/44	Deputy Squadron Commander, 5th Guards Air Regiment of Long-Range Aviation	
PAVLOV, I. F.	2/4/44	Senior Lieutenant, Deputy Squadron Commander, 6th Guards Ground Attack Regiment	
	2/23/45	Captain, Squadron Commander, 6th Guards Ground Attack Regiment	
PARSHIN, G. M.	8[illegible]/44	Captain, Squadron Commander, 943rd Ground Attack Regiment	
	4/19/45	Major, Navigator, 943rd Ground Attack Regiment	

PLOTNIKOV, P. A.	8/19/44	Senior Lieutenant, Deputy Squadron Commander, 81st Guards Bomber Regiment
	6/27/45	Captain, Squadron Commander, 81st Guards Bomber Regiment
POKRYSHEV, P. A.	2/10/43	Major, Squadron Commander, 154th Fighter Regiment
	8/24/43	Major, Commander of the 159th Fighter Regiment
POLBIN, I. S.	11/23/42	Colonel, Commander of the 150th Air Observation Regiment
	4/6/45	General Major of Aviation, Commander of the 2nd Guards Bomber Corps
POPKOV, V. I.	9/8/43	Junior Lieutenant, Flight Commander, 5th Guards Fighter Regiment
	6/27/45	Captain, Squadron Commander, 5th Guards Fighter Regiment
PROKHOROV, A. N.	4/19/45	Senior Lieutenant, Squadron Navigator, 15th Guards Ground Attack Regiment
	6/29/45	Captain, Commander of the 15th Guards Ground Attack Regiment
RAKOV, V. I.	2/7/40	Captain, Commander, 57th Bomber Regiment Air Forces Red Banner Baltic Fleet
	7/22/44	Lieutenant Colonel, Commander of the 12th Guards Bomber Regiment of the Air Forces of the Red Banner Baltic Fleet
RECHKALOV, G. A.	5/24/43	Senior Lieutenant, Flight Commander, 16th Guards Fighter Regiment
	7/1/44	Captain, Deputy Commander of the 16th Guards Fighter Regiment
RYAZANOV, A. K.	8/24/43	Major, Squadron Commander, 4th Fighter Regiment
	8/18/45	Major, Deputy Commander, 4th Fighter Regiment
RYAZANOV, B. G.	2/22/44	General Lieutenant of Aviation, Commander of the First Guards Ground Attack Corps

Page One Title
Cover Page Title
Cover Page Source
(4")
NASA

	6/2/45	General Lieutenant of Aviation, Commander of the First Guards Attack Corps
SAVITSKIY, YE. YA.	5/11/44	General Major of Aviation, Commander of the 3rd Fighter Corps
	6/2/45	General Lieutenant of Aviation, Commander of the 3rd Fighter Corps
SAFONOV, B. F.	9/16/41	Captain, Deputy Commander of the 2nd Fighter Regiment of the Armed Forces of the Northern Fleet
	6/14/42	Lieutenant Colonel, Commander of the 2nd Guards Fighter Regiment of the Air Forces of the Northern Fleet
SEMEYKO, N. I.	4/19/45	Senior Lieutenant, Deputy Squadron Commander, 15th Guards Ground Attack Regiment
	6/29/45	Captain, Navigator for the 15th Guards Fighter Regiment
SEN'KO, V. V.	3/25/43	Junior Lieutenant, Flight Navigator, 10th Guards Air Regiment Long-Range Aviation
	6/29/45	Captain, Squadron Navigator, 752nd Air Regiment Long-Range Aviation
SIVKOV, G. F.	2/4/44	Senior Lieutenant, Squadron Commander, 210th Ground Attack Regiment
	8/18/45	Captain, Navigator, 210th Ground Attack Regiment
SKOMOROKHOV, N. M.	2/23/45	Captain, Squadron Commander, 31st Fighter Regiment
	8/18/45	Major, Squadron Commander, 31st Fighter Regiment
SMIRNOV, A. S.	9/28/43	Captain, Deputy Squadron Commander, 28th Guards Fighter Regiment
	2/23/45	Major, Squadron Commander, 28th Guards Fighter Regiment
SMUSHKEVICH, YA. V.	6/21/37	Division Commander, Commander of Aerial Brigade

Page One Title
Cover Page Title
Cover Page Source
(4")
NASA

	11/17/39	Corps Commander, Deputy Chief of the Air Forces of the RKKA (Workers' and Peasants' Red Army)
STEPANENKO, I. N.	4/13/44	Senior Lieutenant, Deputy Squadron Commander, 4th Fighter Regiment
	8/18/45	Major, Squadron Commander, 4th Fighter Regiment
STEPANISHCHEV, M. T.	10/26/44	Captain, Navigator, 76th Guards Ground Attack Regiment
	6/29/45	Major, Deputy Commander, 76th Guards Ground Attack Regiment
STEPANYAN, N. G.	10/23/42	Junior Lieutenant, Wing Commander, 47th Ground Attack Regiment of the Air Forces of the Red Banner Baltic Fleet
	3/6/45	Lieutenant Colonel, Commander of the 47th Ground Attack Regiment of the Air Forces of the Red Banner Baltic Fleet
STOLYAROV, N.G.	7/1/44	Lieutenant, Flight Commander, 667th Ground Attack Regiment (4th)
	6/27/45	Captain, Navigator, 141st Guards Ground Attack Regiment
SUPRUN, S. P.	5/20/40	Major, Test Pilot
	7/22/41	Lieutenant Colonel, Commander of a Group of Mig-3 Aircraft
TARAN, P. A.	6/20/42	Senior Lieutenant, Flight Commander, 81st Air Regiment Long-Range Aviation
	3/13/44	Major, Squadron Commander, 5th Guards Air Regiment Long-Range Aviation
FEDOROV, YE. P.	4/7/40	Captain, Squadron Commander, 2nd Guards Air Division of Observation Dirigibles Long-Range Aviation
	6/29/45	Lieutenant Colonel, Deputy Commander of the 2nd Guards Air Division Long-Range Aviation
KHRYUKIN, T. T.	2/22/39	Captain, Commander of a Bomber Squadron
	4/19/45	General Colonel of Aviation, Commander of the First Air Army

Cover Page Source
NASA

CHELNOKOV, N. V.	6/14/42	Captain, Squadron Commander, 57th Aerial Regiment of the Armed Forces of the Red Banner Baltic Fleet
	8/19/44	Lieutenant Colonel, Commander of the 8th Guards Ground Attack Regiment of the Air Forces of the Red Banner Baltic Fleet

Heroes of the Soviet Union /502

ABAZOVSKIY, K. A.	10/26/44	Lieutenant, Flight Commander, 190th Ground Attack Regiment
ABDIROV, N.	3/31/43	Sergeant, Airman 808th Ground Attack Regiment
ABDRASHITOV, SH. M.	8/2/44	Lieutenant, Deputy Squadron Commander, Navigator, 402nd Fighter Regiment
ABRAMOV, V. F.	7/22/44	Captain, Squadron Commander, First Guards Fighter Regiment of the Air Forces of the Red Banner Baltic Fleet
ABRAMOV, P. P.	2/23/48	Major, Air Detachment Commander, 31st Guards Air Regiment Long-Range Aviation
ABRAMCHUK, N. I.	10/9/43	Captain, Squadron Commander, 894th Fighter Regiment Air Defense
ABUKHOV, K. V.	6/27/45	Major, Commander, 143rd Ground Attack Regiment
AVDEYEV, A. F.	2/10/43	Sr. Lieutenant, Deputy Squadron Commander, 153rd FIghter Regiment
AVDEYEV, M. V.	6/14/42	Captain, Squadron Commander, 6th Guards Air Regiment, Black Sea Fleet, Air Force
AVDEYEV, N. D.	8/19/44	Captain, Navigator in Squadron of 8th Guards, Air Regiment, Long Range Aviation
AVEKOV, I. A.	8/24/43	Captain, Squadron Commander, 519th, Fighter Regiment
AVER'YANOV, V. G.	4/19/45	Junior Lieutenant, Pilot, 15th Guards, Ground Attack Regiment
AVER'YANOV, K. A.	10/26/44	Lieutenant, Deputy Squadron Commander, 7th Guards Ground Attack Regiment

AGAMIROV, G. G.	11/5/44	Captain, Squadron Commander, 337th Air Regiment, Long Range Aviation
AGEYEV, L. N.	3/25/43	Senior Lieutenant, Navigator, 7th Air Regiment Long-Range Aviation
AGEYEV, P. G.	2/14/43	Senior Lieutenant, Wing Commander, 182nd Air Defense Fighter Regiment
AGLOTKOV, F. N.	11/5/44	Captain, Squadron Navigator, 5th Guards Air Regiment Air Forces
ADONKIN, V. S.	1/22/44	Captain, Squadron Commander, 78th Air Regiment Air Forces Northern Fleet
AZAROV, YE. A.	8/19/44	Major, Squadron Commander, 19th Fighter Regiment
AZAROV, P. L.	4/19/45	Lieutenant, Flier, 134th Guards Bomber Regiment
AZAROV, S. S.	9/2/43	Senior Lieutenant, Deputy Squadron Commander, 57th Fighter Regiment
AYRIYEV, A. T.	4/13/44	Captain, Squadron Commander, 503rd Ground Attack Regiment
AKAYEV, YU. A.	8/19/44	Captain, Squadron Commander, 47th Ground Attack Regiment of the Air Forces of the Red Banner Baltic Fleet
AKIMOV, M. I.	5/15/46	Lieutenant, Deputy Squadron Commander, 451st Ground Attack Regiment
AKKURATOV, F. YA.	3/21/40	Junior Commander, Air Radio Gunner, 50th High Speed Bomber Regiment
AKSENOV, K. F.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 82nd Guards Bomber Regiment
AKULENKO, V. YE.	2/23/45	Senior Lieutenant, Squadror Commander, 955th Ground Attack Regiment
ALASHEYEV, YU. T.		Major
ALGAZIN, A. K.	9/18/43	Captain, Flight Navigator, 9th Guards Air Regiment Long-Range Aviation

ALEYNIKOV, S. P.	8/19/44	Major, Navigator, 16th Guards Air Regiment Long-Range Aviation
ALEKSANDROV, G. P.	2/4/44	Senior Lieutenant, Squadron Commander, 673rd Ground Attack Regiment
ALEKSANDRYUK, V. I.	6/29/45	Lieutenant, Flight Commander, 176th Guards Fighter Regiment
ALEKSASHKIN, N. F.	6/27/45	Senior Lieutenant, Flight Commander, 93rd Guards Ground Attack Regiment /503
ALEKSEYEV, A. D.	6/27/37	Colonel, Commander of the N-172 Aircraft
ALEKSEYEV, B. P	3/31/43	Junior Lieutenant, Deputy Squadron Commander, 808th Ground Attack Regiment
ALEKSEYEV, G. A.	6/20/42	Senior Lieutenant, Flight Commander, 21st Air Regiment Long-Range Aviation
ALEKSEYEV, G. F.	5/15/46	Master Sergeant, Aerial Radio Gunner, 128th Bomber Regiment
ALEKSEYEV, K. S.	6/14/42	Captain, Deputy Commander, 6th Guards Air Regiment of the Air Forces of the Black Sea Fleet (4th)
ALEKSEYEV, M. N.	7/27/43	Captain, Navigator, 19th Guards Air Regiment, Long-Range Aviation
ALEKSEYEV, N. A.	8/19/44	Major, Navigator, 18th Guards Air Regiment, Long-Range Aviation
ALEKSEYEV, N. M.	8/24/43	Junior Lieutenant, Flight Commander, 64th Guards Fighter Regiment
ALEKSEYEV, P. F.	6/27/45	Captain, Squadron Commander, 142nd Guards Ground Attack Regiment
ALEKSEYENKO, G. A.	10/26/44	Senior Lieutenant, Squadron Commander, 637th Ground Attack Regiment
ALEKSUKHIN, V. T.	2/4/44	Lieutenant. Flight Commander, 617th Ground Attack Regiment
ALEKHNOVICH, A. A.	8/19/44	Major, Deputy Squadron Commander, 6th Guards Air Regiment Long-Range Aviation
ALEKHNOVICH, YE. A.	6/27/45	Senior Lieutenant, Squadron Commander, 142nd Guards Ground Attack Regiment

Page One Title
Cover Page Title
Cover Page Source
AAA

ALESHIN, S. M.	2/10/43	Captain, Flight Commander, 44th Bomber Regiment
ALIMKIN, I. N.	4/13/44	Junior Lieutenant, Deputy Squadron Commander, 617th Ground Attack Regiment
ALIN, V. I.	8/19/44	Captain, Flight Commander, 10th Guards Air Regiment Long-Range Aviation
ALIFANOV, N. G.		Colonel
ALKIDOV, V. YA.	8/12/42	Lieutenant, Flight Commander, 434th Fighter Regiment
ALFER'YEV, N. S.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 92nd Guards Ground Attack Regiment
ALbVER, M.	11/27/44	Senior Lieutenant, Flight Commander for the "Normandia-Neman" Regiment
AMELIN, A. S.	10/26/44	Senior Lieutenant, Squadron Commander, 240th Fighter Regiment
AMELIN, G. I.	5/15/46	Lieutenant, Deputy Squadron Commander, 208th Ground Attack Regiment
AMOSOV, A. I.	8/2/44	Lieutenant, Deputy Squadron Commander, 672nd Ground Attack Regiment
ANAN'IN, S. K.	9/8/43	Major, Commander, 299th Ground Attack Regiment
ANDREYEV, V. M.		Lieutenant Colonel
ANDREYEV, YE. N.		Major
ANDREYEV, I. F.	12/31/42	Captain, Flight Commander, 2nd Guards Air Regiment Long-Range Aviation
ANDREYEV, P. K.	6/29/48	Senior Lieutenant, Deputy Squadron Commander, 683rd Ground Attack Regiment
ANDRE\ENKO, YE. G	5/15/46	Senior Lieutenant, Flier, 20th Guards Bomber Regiment Long-Range Aviation
ANDRIANOV, I. F.	8/19/44	Captain, Squadron Commander, 153rd Guards Fighter Regiment
ANDRZ, KH.	6/4/45	Lieutenant, Flight Commander for the "Normandia-Neman" Regiment

Page One Title
Cover Page Title
Cover Page Source
(4")
NASA

ANDRYUSHIN, YA. I.	8/24/43	Captain, Squadron Commander, 128th Bomber Regiment
ANISIMOV, V. V.	3/27/42	Captain, Squadron Commander, 5th Bomber Regiment
ANISKIN, A. D.	2/22/43	Senior Lieutenant, Flier, 32nd Guards Fighter Regiment
ANISOV, V. F.	10/26/44	Captain, Squadron Commander, 76th Guards Ground Attack Regiment
ANKUDINOV, YE. YE.	5/15/46	Major, Deputy Commander, 812th Fighter Regiment
ANOKHIN, A. V.	10/26/44	Senior Lieutenant, Flight Commander, 119th Independent Air Observation Squadron
ANOKHIN, K. YE.	7/22/41	Lieutenant, Flight Commander, 170th Air Regiment
ANOKHIN, S. N.		Colonel
ANPILOV, A. A.	7/1/44	Captain, Squadron Commander, 779th Bomber Regiment
ANTIPIN, I. A.	7/1/44	Lieutenant, Flier, 667th Ground Attack Regiment
ANTIPOV, M. N.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 707th Ground Attack Regiment
ANTIPOV, YU. A.		Colonel
ANTONENKO, A. K.	7/14/41	Captain, Flight Commander, 5th Fighter Regiment Air Forces Red Banner Baltic Fleet
ANTONOV, V. A.	8/2/44	Lieutenant, Squadron Commander, 94th Guards Ground Attack Regiment
ANTONOV, N. D.	3/21/40	Battalion Commissar, Military Commissar for the 7th Fighter Regiment
ANTONOV, S. M.		Lieutenant Colonel
ANTONOV, YA. I.	3/21/40	Senior Lieutenant, Deputy Squadron Commander, 25th Fighter Regiment
ANTOSHKIN, I. D.	5/20/40	Major, A Commander, 18th High Speed Bomber Regiment

ANUFRIYEV, M. A.	4/19/45	Major, Deputy Squadron Commander, 523rd Fighter Regiment
APRAKSIN, S. A.	6/29/45	Junior Lieutenant, Flier, 74th Guards Ground Attack Regiment
ARGUNOV, N. F.	2/23/45	Senior Lieutenant, Squadron Navigator, 35th Guards Bomber Regiment
AREF'YEV, P. A.	2/23/45	Captain, Squadron Commander, 896th Ground Attack Regiment
ARZHANOV, N. N.		
ARMASHOV, G. I.	8/24/43	Major, Navigator, 261st Bomber Regiment
ARONOVA, R. YE.	5/15/46	Lieutenant, Flier, 46th Guards Night Bomber Regiment
ARSEN'YEV, N. L.	8/18/45	Captain, Squadron Commander, 63rd Night Bomber Regiment
ARTAMONOV, A. A.	3/27/42	Lieutenant, Pilot, 168th Fighter Regiment
ARTAMONOV, V. D.	8/18/45	Senior Lieutenant, Flight Commander, 165th Guards Ground Attack Regiment
ARTAMONOV, V. I.	11/17/39	Captain, Squadron Commander, 38th High Speed Bomber Regiment
ARTAMONOV, N. S.	8/19/44	Senior Lieutenant, Commanders Aide, 193rd Fighter Regiment
ARTEMENKO, A. P.	6/27/45	Captain, Squadron Commander, 93rd Guards Ground Attack Regiment
ARTEMCHENKOV, G. F.	6/27/45	Lieutenant, Flight Commander, 106th Guards Fighter Regiment
ARTEM'YEV, A. A.	4/19/45	Senior Lieutenant, Deputy Squadron Commander, 566th Ground Attack Regiment
ARTEM'YEV, F. P.	3/13/44	Captain, Squadron Commander, 24th Air Regiment Long-Range Aviation
ARKHANGEL'SKIY, N. V.	10/26/44	Lieutenant, Deputy Squadron Commander, 57th Bomber Regiment
ARKHAROV, P. M.	3/13/44	Major, Deputy Squadron Commander, 890th Air Regiment Long-Range Aviation

Page One Title
Cover Page Title
Cover Page Source
NASA

/505

ARKHIPENKO, F. F.	6/27/45	Major, Deputy Commander, 129th Guards Fighter Regiment
ARKHIPOV, N. A.	9/28/43	Captain, Squadron Commander, 32nd Fighter Regiment
ARCHAKOV, N. I.	6/29/45	Captain, Squadron Commander, 999th Ground Attack Regiment
ASADCHIKH, B. YE.	6/29/45	Captain, Squadron Commander, 136th Guards Ground Attack Regiment
ASEYEV, G. S.	11/5/44	Senior Sergeant, Aerial Radio Gunnery, 9th Guards Mine Torpedo Air Regiment Air Forces Northern Fleet
ASTAKHOV, I. M.	7/1/44	Captain, Squadron Commander, 49th Fighter Regiment
ASTASHKIN, M. YE.	2/10/42	Captain, Squadron Commander, 69th Fighter Regiment
ASYAMOV, S. A.	6/20/42	Major, Aircraft Commander, 746th Air Regiment Long-Range Aviation
AFANAS'YEV, B. M.	6/29/45	Senior Lieutenant, Deputy Commander, 21st Fighter Regiment
AFANAS'YEV, V. N.	6/27/45	Captain, Commanders Aide, 94th Guards Ground Attack Regiment
AFANAS'YEV, V. I.	3/29/44	Senior Lieutenant, Deputy Squadron Commander, 145th Guards Fighter Regiment Air Defense
AFANAS'YEV, M. A.	6/27/45	Major, Deputy Commander, 143rd Guards Ground Attack Regiment
AFANAS'YEV, M. D.	8/18/45	Senior Lieutenant, Flight Commander, 807th Ground Attack Regiment
AFANAS'YEV, N. F.	5/31/44	Captain, Flight Navigator, First Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
AKHMAMET'YEV, A. A.	2/23/45	Captain, Deputy Squadron Commander, 10th Indepedent Air Observation Regiment
ACHKASOV, S. V.	2/4/43	Lieutenant, Flight Commander, 176th Fighter Regiment

Page One Title
Cover Page Title
Cover Page Source
NASA

BABAILOV, P. K.	2/23/45	Captain, Squadron Commander, 163rd Guards Fighter Regiment
BABAK, I. I.	11/1/43	Junior Lieutenant, Flight Commander, 100th Guards Fighter Regiment
BABANOV, I. D.	11/5/44	Lieutenant, Flight Navigator, First Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
BABENKO, A. F.		Major
BABKIN, M. I.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 198th Ground Attack Regiment
BABKOV, V. P.	11/23/42	Captain, Navigator, 434th Fighter Regiment
BABUSHKIN, A. V.	4/19/45	Captain, Squadron Navigator, 10th Independent Air Observation Regiment
BABUSHKIN, M. S.	6/27/37	Pilot for Polar Aviation
BADYUK, M. M.	2/22/44	Master Sergeant, Aerial Radio Gunner, 9th Guards Mine Torpedo Air Regiment Air Forces Northern Fleet
BAYEVSKIY, G. A.	2/4/44	Senior Lieutenant, Deputy Commander, 5th Guards Fighter Regiment
BAZHANOV, G. S.	7/22/44	Captain, Squadron Navigator, First Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
BAZHENOV, G. F.	8/19/44	Captain, Squadron Commander, 19th Guards Air Regiment Long-Range Aviation
BAZANOV, P. V.	10/26/44	Captain, Deputy Squadron Commander, 3rd Guards Fighter Regiment
BAZAROV, I. F.	9/2/43	Captain, Squadron Commander, 247th Fighter Regiment
BAYDUKOV, G. F.	7/24/36	Colonel, Test pilot
BAYKOV, G. I.	6/29/45	Senior Lieutenant, Flight Commander, 9th Guards Fighter Regiment
BAYMURZIN, G. I.	11/5/44	Major, Deputy Squadron Commander, 13th Guards Air Regiment Long-Range Aviation

Cover Page Title
Cover Page Source
(47)
NASA

BAYSULTANOV, A. YU.	10/23/42	Captain, Deputy Squadron Commander, 4th Guards Fighter Regiment Air Forces Red Banner Baltic Fleet
BAKLAN, A. YA.	11/23/42	Senior Lieutenant, Flight Commander, 434th Fighter Regiment
BALABANOV, A. I.	6/29/45	Major, Squadron Commander, 135th Guards Bomber Regiment
BALABIN, YU. M.	6/27/45	Captain, Navigator, 144th Guards Ground Attack Regiment
BALAKIREV, N. M.	7/1/44	Senior Lieutenant, Squadron Commander, 218th Ground Attack Regiment
BALALUYEV, A. A.	8/18/45	Major, Instructor-Pilot for the Combat Training Directorate of the Air Force
BALAMUTKIN, G. V.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 431st Ground Attack Regiment
BALANDIN, V. A.	4/19/45	Senior Lieutenant, Flight Commander, 18th Guards Fighter Regiment
BALANOV, N. F.	6/27/37	Captain, Detachment Commander, 107th Squadron
BALASHEV, A. I.	8/29/39	Captain, Deputy Commander, 22nd Fighter Regiment
BALASHOV, V. D.	8/24/43	Captain, Deputy Squadron Commander, 8th Independent Air Observation Regiment
BALASHOV, G. S.	7/1/44	Captain, Squadron Commander, 402nd Fighter Regiment
BALASHOV, V. P.	7/24/44	Captain, Flight Commander, 24th Mine Torpedo Air Regiment Air Forces Northern Fleet
BALASHOV, YE. I.	6/27/45	Senior Lieutenant, Navigator, 95th Guards Ground Attack Regiment
BALASHOV, I. F.	4/7/40	Major, Deputy Commander, 6th Long-Range Bomber Regiment
BALDIN, A. M.	4/13/44	Lieutenant, Flight Commander, 92nd Guards Ground Attack Regiment
BALEBIN, V. A.	2/22/43	Captain, Deputy Squadron Commander, First Mine Laying Air Regiment Air Forces Red Banner Baltic Fleet

NASA

BALENKO, A. A.	11/5/44	Lieutenant Colonel, Commander, 22nd Guards Air Regiment Long-Range Aviation
BALENKO, N. F.	8/18/45	Senior Lieutenant, Flight Commander, 6th Independent Guards Ground Attack Regiment
BALYUK, I. F.	8/24/43	Captain, Squadron Commander, 54th Guards Fighter Regiment
BALTASINKOV, A. I.	2/23/45	Captain, Squadron Commander, 181st Guards Fighter Regiment
BANIFATOV, I. S.	3/6/45	Senior Lieutenant, Deputy Squadron Commander, 35th Ground Attack Regiment Air Forces Red Banner Baltic Fleet
BARANENKO, V. YA.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 947th Ground Attack Regiment
BARANOV, I. YE.	2/23/45	Senior Lieutenant, Squadron Commander, 807th Ground Attack Regiment
BARANOV, M. D.	8/12/42	Senior Lieutenant, Flight Commander, 183rd Fighter Regiment
BARANOV, M. S.	8/24/43	Junior Lieutenant, Flight Commander, 157th Fighter Regiment
BARANOV, P. G.	12/31/42	Junior Lieutenant, Navigator, 5th Guards Air Regiment Long-Range Aviation
BARASHEV, D. I.	3/25/43	Senior Lieutenant, Flight Commander, 752nd Air Regiment Long-Range Aviation
BARBASHINOV, M. N.	9/14/45	Major, Commander, 37th Ground Attack Regiment Air Forces Pacific Ocean Fleet
BARDEYEV, A. P.	12/13/42	Major, Squadron Commander, 366th Bomber Regiment
BARKOVSKIY, V. A.	2/14/43	Junior Lieutenant, Flier, 591st Fighter Regiment
BARSKIY, A. I.	5/15/45	Captain, Squadron Commander, 12th Guards Bomber Regiment Air Forces Red Banner Baltic Fleet
BARSUKOV, V. N.	4/19/45	Captain, Squadron Commander, 18th Guards Fighter Regiment

/507

BARTASHOV, M. V.	9/14/45	Colonel, Commander, 12th Ground Attack Division Air Force Pacific Ocean Fleet
BARCHENKOV, D. G.	6/29/45	Captain, Squadron Commander, 897th Fighter Regiment
BARSHT, A. A.	4/10/45	Major, Squadron Commander, 118th Independent Air Observation Regiment
BASINSKIY, V. L.	8/18/45	Lieutenant, Flier, 165th Guards Ground Attack Regiment
BASKOV, V. S.	2/23/48	Major, Squadron Commander, 291st Fighter Regiment
BASULIN, YE. D.	9/28/43	Captain, Squadron Commander, 239th Fighter Regiment
BATAROV, M. F.	8/18/45	Major, Squadron Commander, 611th Fighter Regiment
BATIEVSKIY, A. M.	3/6/45	Senior Lieutenant, Deputy Squadron Commander, 35th Ground Attack Regiment
BATIN'KOV, S. A.	6/29/45	Captain, Squadron Commander, 208th Ground Attack Regiment
BATURIN, A. G.	10/23/42	Senior Lieutenant, Deputy Squadron Commander, 71st Fighter Regiment Air Force Red Banner Baltic Fleet
BATYREV, P. M.	2/23/45	Captain, Deputy Commander for Aerial Gunnery Service, 163rd Guards Fighter Regiment
VATYAYEV, V. S.	5/15/46	Captain, Squadron Commander, 54th Guards Fighter Regiment
BAKHAYEV, S. A.		Captain
BAKHVALOV, G. P.	2/4/44	Captain, Aircraft Navigator, 11th Independent Air Observation Regiment
BAKHVALOV, V. P.	1/15/40	Aerial Radio Gunner, 2nd Bomber Regiment
BAKHTIN, I. P.	8/18/45	Lieutenant Colonel, Commander, 190th Ground Attack Regiment
BAKHTIN, M. I.	2/23/45	Lieutenant, Flight Commander, 43rd Guards Ground Attack Regiment

BASHARIN, I. V.	8/19/44	Senior Lieutenant, Deputy Squadron Commander, 810th Ground Attack Regiment
BASHKIROV, V. A.	2/4/44	Captain, Deputy Commander, 519th Fighter Regiment
BASHKIROV, V. F.	2/8/43	Junior Political Officer, Deputy Commander for Political Affairs, 788th Fighter Regiment
BASHKIROV, F. A.	7/1/44	Captain, Squadron Commander, 62nd Ground Attack Regiment
BASHTYRKOV, A. A.	2/22/43	Captain, Flight Commander, 24th Mine Torpedo Air Regiment Air Forces Northern Fleet
BEZBOKOV, V. M.	6/29/45	Captain, Deputy Squadron Commander, 7th Guards Air Regiment Long-Range Aviation
BEZVERKHIY, A. I.	6/27/45	Senior Lieutenant, Squadron Commander, 156th Guards Fighter Regiment
BEZOBRAZOV, G. I.	9/18/43	Senior Lieutenant, Flight Navigator, 10th Guards Air Regiment Long-Range Aviation
BEZUKH, M. I.	7/1/44	Major, Navigator, 565th Ground Attack Regiment
BEKASHONOK, M. V.	6/27/45	Captain, Deputy Commander, 129th Guards Air Regiment for the Aerial Gunnery Service
BELAVIN, N. I.	10/26/44	Captain, Squadron Commander, 33rd Guards Ground Attack Regiment
BELIK, V. L.	2/23/45	Lieutenant, Flight Navigator, 46th Guards Night Bomber Regiment
BELIKOV, V. M.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 109th Guards Attack Regiment
BELIKOV, O. S.	9/18/44	Captain, Squadron Commander, 19th Fighter Regiment /508
BELIKOV, P. V.	7/21/42	Senior Lieutenant, Flight Commander, 240th Independent Air Observation Squadron
BELKIN, A. N.	2/4/44	Senior Lieutenant, Squadron Commander, 164th Fighter Regiment
BELOV, I. M.	2/5/40	Lieutenant, Flight Commander, 5th Air Evacuation Regiment

NASA

BELOGUROV, A. I.	2/7/40	Lieutenant, Radio Gunner, 40th Bomber Regiment Air Forces Black Sea Fleet
BELOZEROV, I. P.	5/16/44	Senior Lieutenant, Flight Commander, 6th Guards Fighter Regiment Air Forces Black Sea Fleet
BELOKON', K. F.	10/26/44	Captain, Squadron Commander, 103rd Ground Attack Regiment
BELOUS, A. I.	5/15/46	Lieutenant, Flight Commander, 810th Ground Attack Regiment
BELOUSOV, V. I.	3/21/40	Captain, Squadron Commander, 9th Ground Attack Regiment
BELOUSOV, N. P.	7/1/44	Lieutenant, Flight Commander, 193rd Fighter Regiment
BELOUSOV, L. G.	4/10/57	Major, Squadron Commander, 4th Guards Fighter Regiment Air Forces Red Banner Baltic Fleet
BELYAVIN, YE. S.	2/4/44	Senior Lieutenant, Deputy Squadron Commander, 80th Guards Bomber Regiment
BELYAYEV, P. I.		Colonel, Cosmonaut (41)
BELYAKOV, I. YA.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 594th Ground Attack Regiment
BELYAKOV, A. V.	7/24/36	Brigade Commander, Navigator for an ANT-25 Aircraft
BELYASNIK, P. N.	4/28/43	Captain, Navigator, 126th Fighter Regiment Air Defense
BENDELYAANI, CH. K.	8/24/43	Major, Navigator, 54th Guards Fighter Regiment
BEREGOROY, G. T.	10/26/44	Captain, Squadron Commander, 90th Guards Ground Attack Regiment
BEREZHKOV, I. B.	8/18/45	Lieutenant, Flight Commander, 807th Ground Attack Regiment
BEREZUTSKIY, I. M.	2/23/45	Major, Navigator, 63rd Guards Fighter Regiment
BERESTNEV, P. M.	5/24/43	Senior Lieutenant, Deputy Squadron Commander, 45th Fighter Regiment

Cover Page Source
NASA

BERKUTOV, A. M.	8/2/44	Major, Navigator, 101st Guards Fighter Regiment
BERNIKOV, M. M.	5/15/46	Major, Squadron Commander, 809th Ground Attack Regiment
BESCHASTNYY, S. A.	5/15/46	Captain, Squadron Commander, 235th Ground Attack Regiment
BIBISHEV, I. F.	8/24/43	Lieutenant, Deputy Squadron Commander, 59th Guards Ground Attack Regiment
BIZHKO, V. E.	5/15/46	Lieutenant, Flight Commander, 92nd Guards Ground Attack Regiment
BIZYAYEV, D. I.	5/15/46	Lieutenant, Flight Commander, 173rd Guards Ground Attack Regiment
BILYUKIN, A. D.	11/2/44	Captain, Squadron Commander, 196th Fighter Regiment
BIRYUKOV, B. V.	11/20/41	Lieutenant, Squadron Commander, 92nd Fighter Regiment
BIRYUKOV, B. N.		(4")
BIRYUKOV, V. N.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 723rd Ground Attack Regiment
BIRYUKOV, S. K.	6/20/42	Captain, Deputy Commander, 42nd Air Regiment Long-Range Aviation
BITYUTSKIY, P. S.	11/5/42	Junior Political Officer, Squadron Military Commissar, 66th Ground Attack Regiment
BITSAYEV, S. B.	8/18/45	Lieutenant, Flight Commander, 845th Fighter Regiment
BLAGOVESHCHENSKIY, A. S.	11/14/38	Colonel, Commander, 27th Air Division
BLAGODAROV, K. V.	4/20/45	Senior Lieutenant, Deputy Squadron Commander, 8th Guards Ground Attack Regiment Air Forces Red Banner Baltic Fleet /509
BLINOV, P. F.	4/10/45	Senior Lieutenant, Flight Commander, 141st Ground Attack Regiment
BLOKHIN, I. I.	9/28/43	Major, Navigator, 239th Fighter Regiment
BOBIN, N. A.	12/31/42	Captain, Deputy Squadron Commander, 7th Air Regiment Long-Range Aviation

Cover Page Title
Cover Page Source
NASA

BOBKOV, V. V.	6/27/45	Captain, Squadron Commander, 106th Guards Fighter Regiment
BOBROV, L. N.	4/19/45	Major, Squadron Commander, 134th Guards Bomber Regiment
BOBROV, N. A.	2/10/43	Senior Sergeant, Radio Gunner, 44th High Speed Bomber Regiment
BOBROVSKIY, A. A.		Captain
BOGACHEV, A. A.	3/6/45	Junior Lieutenant, Flier, 51st Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
BOGDANOV, A. S.	5/15/46	Senior Lieutenant, Flight Commander, 58th Guards Ground Attack Regiment
BOGDANOV, V. I.	8/18/45	Captain, Deputy Squadron Commander, 828th Ground Attack Regiment
BOGDANOV, F. D.		Captain
BOGOMAZOV, G. I.	9/2/43	Senior Lieutenant, Deputy Squadron Commander, 158th Fighter Regiment
BOGOMOLOV, A. M.	9/18/43	Major, Deputy Squadron Commander, 6th Guards Air Regiment Long-Range Aviation
BOGUTSKIY, V. S.	8/18/45	Senior Lieutenant, Flight Commander, 99th Guards Independent Air Observation Regiment
BOYKO, G. YE.	7/21/42	Senior Lieutenant, Flight Commander, 514th Dive Bomber Regiment
BOYKOV, I. T.	6/27/45	Senior Lieutenant, Squadron Commander, 155th Guards Ground Attack Regiment
BOYTSOV, F. S.	2/23/45	Senior Lieutenant, Flight Commander, 74th Guards Ground Attack Regiment
BOYTSOV, A. S.		Major
BOKIY, N. A.	7/24/43	Junior Lieutenant, Flight Commander, 2nd Guards Fighter Regiment
BOLOTOV, V. G.	4/12/42	Senior Lieutenant, Deputy Squadron Commander, 61st Ground Attack Regiment
BONDARENKO, V. YE.	6/27/45	Senior Lieutenant, Flight Commander, 16th Guards Fighter Regiment

BONDAR', A. A.	8/19/44	Senior Lieutenant, Deputy Squadron Commander, 866th Fighter Regiment
BONDAR', A. A.	4/13/44	Captain, Squadron Commander, 59th Guards Ground Attack Regiment
BOROZENETS, S. N.	8/18/45	Lieutenant, Flight Commander, 569th Ground Attack Regiment
BORDYUGOV, A. A.	8/18/45	Senior Lieutenant, Flight Commander, 955th Ground Attack Regiment
BORZOV, I. I.	7/22/44	Major, Commander, First Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
BORISENKO, I. I.	5/15/46	Captain, Deputy Squadron Commander, 73rd Guards Fighter Regiment
BORISOV, V. A.	12/31/42	Major, Flight Commander, 3rd Guards Air Regiment Long-Range Aviation
BORISOV, V. D.	2/23/45	Captain, Flight Commander, 8th Independent Air Observation Regiment
BORISOV, V. I.	8/19/44	Captain, Flight Commander, 10th Guards Air Regiment Long-Range Aviation
BORISOV, I. G.	11/1/43	Lieutenant, Flight Commander, 9th Guards Fighter Regiment /510
BORISOV, I. D.	2/7/40	Senior Lieutenant, Deputy Squadron Commander, 5th Fighter Regiment
BORISOV, M. A.	5/6/65	Junior Lieutenant, Flier, 62nd Fighter Regiment Air Forces Black Sea Fleet
BORISOV, M. V.	3/6/45	Lieutenant, Deputy Squadron Commander, 51st Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
BORISOV, P. S.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 686th Ground Attack Regiment
BOROVKOV, O. N.	2/22/39	Major, Deputy Commander, 21st Long-Range Bomber Regiment
BOROVIKOV, A. YE.	10/25/38	Lieutenant, Observation Pilot, 59th High Speed Bomber Squadron
BOROVKOV, V. D.		Captain

Cover Page Title
Cover Page Source
NASA

BORODACHEV, V. I.	7/1/44	Captain, Squadron Commander, 40th Guards Fighter Regiment
BORODIN, A. I.	5/1/43	Senior Lieutenant, Chief of the Aerial Gunnery Service, 504th Ground Attack Regiment
BORODIN, V. P.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 565th Ground Attack Regiment
BORODIN, N. V.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 43rd Fighter Regiment
BORONIN, I. K.	12/13/42	Major, Squadron Commander, 366th Bomber Regiment
BORONIN, M. P.	2/22/44	Lieutenant, Flight Navigator, 9th Guards Mine Torpedo Air Regiment Air Forces Northern Fleet
BORSHCHEV, S. T.	5/15/46	Lieutenant Colonel, Deputy Commander of 79th Guards Ground Attach Regiment
BOCHAROV, V. M.	12/31/36	Senior Lieutenant, Detachment Commander,
BOCHIN, P. A.	11/1/43	Lieutenant, Flight Commander, 10th Guards Bomber Regiment
BOCHKOV, I. V.	5/1/43	Captain, Chief of the Aerial Gunnery Service, 19th Guards Fighter Regiment
BRAGIN, A. V.	5/15/46	Lieutenant, Flight Commander, 825th Ground Attack Regiment
BRAGINETS, N. G.	5/19/40	Senior Lieutenant, Flight Commander, 63rd Bomber Regiment
BRAZHNIKOV, A. N.	2/23/45	Lieutenant, Flight Commander, 237th Ground Attack Regiment
BRAZHNIKOV, I. M.	3/27/42	Sergeant, Radio Gunner, 132nd High Speed Bomber Regiment
BREKHOV, K. V.	5/1/43	Captain, Squadron Commander, 62nd Ground Attack Regiment
BRIN'KO, F. A.	7/14/41	Lieutenant, Deputy Squadron Commander, 13th Fighter Regiment Air Forces Red Banner Baltic Fleet
BRITIKOV, A. P.	5/15/46	Captain, Squadron Commander, 85th Guards Fighter Regiment

BURMATOV, V. A.	5/31/44	Senior Lieutenant, Navigator, 255th Fighter Regiment, Air Forces Northern Fleet
BURMISTROV, M. F.	11/17/39	Major, Commander, 150th High Speed Bomber Regiment
BURNAZYAN, S. A.	8/2/44	Senior Lieutenant, Squadron Commander, 866th Fighter Regiment
BURYAK, N. V.	2/4/44	Senior Lieutenant, Squadron Commander, 247th Fighter Regiment
BUSLOV, F. V.	6/29/45	Senior Lieutenant, Deputy Squadron Commander, 136th Guards Ground Attack Regiment
BUTKO, A. S.	2/4/44	Senior Lieutenant, Squadron Commander, 667th Ground Attack Regiment
BUKHANOV, A. D.	6/27/45	Lieutenant, Flight Commander, 36th Guards Bomber Regiment
BUKHNIN, F. P.	8/18/45	Lieutenant, Flier, 783rd Ground Attack Regiment
BUCHAVYY, V. P.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 24th Bomber Regiment
BUCHIN, B. V.	4/19/45	Senior Lieutenant, Flight Commander, 136th Guards Ground Attack Regiment
BUYANOV, V. N.	9/2/43	Major, Deputy Commander for Political Affairs, 146th Fighter Regiment
BYKASOV, N. V.	4/10/45	Senior Lieutenant, Deputy Commander, 156th Guards Fighter Regiment
BYKOV, M. S.	5/15/46	Captain, Squadron Commander, 571st Ground Attack Regiment
BYKOV, N. P.	7/1/44	Senior Lieutenant, Deputy Squadron Commander, 237th Ground Attack Regiment
BYIKOVETS, L. A.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 28th Guards Fighter Regiment
BYKOVSKIY, V. F.		Major, Cosmonaut
BYKOVSKIY, YE. V.	5/14/65	Junior Lieutenant, Flier, 5th Guards Fighter Regiment

Cover Page Source
NASA

BYSTROV, N. I.	6/29/45	Senior Lieutenant, Deputy Squadron Commander, 996th Ground Attack Regiment
BYSTRYKH, D. S.	11/5/42	Senior Lieutenant, Flight Commander, 99th Short-Range Bomber Regiment
VAGIN, S. T.	5/15/46	Junior Lieutenant, Flier, 175th Guards Ground Attack Regiment
VAZHINSKIY, A. G.	6/27/45	Major, Squadron Commander, 6th Bomber Regiment
VAKUL'SKIY, A. V.	6/29/45	Captain, Squadron Commander, 949th Ground Attack Regiment
VALEYEV, A. Z.	5/15/46	Major, Squadron Commander, 179th Fighter Regiment
VALENTIK, D. D.	5/7/40	Captain, Squadron Commander, 5th High Speed Bomber Regiment /512
VALUKHOV, I. S.	8/19/44	Captain, Squadron Commander, 334th Air Regiment Long-Range Aviation
VARCHUK, N. I.	9/28/43	Major, Commander, 737th Fighter Regiment
VASEV, I. T.	8/18/45	Senior Lieutenant, Flight Commander, 165th Guards Ground Attack Regiment
VASILEVSKIY, V. G.	11/5/44	Captain, Squadron Navigator, 30th Independent Air Observation Regiment Air Forces Black Sea Fleet
VASILEVSKIY, YE. V.	5/15/46	Captain, Squadron Commander, 151st Guards Fighter Regiment
VASILENKO, S. I.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 312th Ground Attack Regiment
VASILENKO, F. YE.	3/13/44	Captain, Squadron Navigator, 10th Guards Air Regiment Long-Range Aviation
VASIL'YEV, A. M.	5/15/46	Major, Deputy Commander, 173rd Guards Ground Attack Regiment
VASIL'YEV, A. A.	6/29/45	Senior Lieutenant, Deputy Squadron Commander, 340th Bomber Regiment
VASIL'YEV, A. N.	10/26/44	Captain, Squadron Commander, 198th Ground Attack Regiment

Cover Page Source
NASA

VASIL'YEV, B. M.	11/20/41	Senior Political Officer, Squadron Military Commissar, 44th Fighter Division
VASIL'YEV, V. V.	3/13/44	Captain, Squadron Commander, 42nd Air Regiment Long-Range Aviation
VASIL'YEV, G. D.	2/22/44	Captain, Flight Commander, First Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
VASIL'YEV, M. P.	6/29/45	Lieutenant, Flight Commander, 75th Guards Ground Attack Regiment
VASIL'YEV, M. YA.	6/14/42	Senior Lieutenant, Squadron Commander, 4th Guards Fighter Regiment Air Forces Red Banner Baltic Fleet
VASIL'YEV, N. K.	5/15/46	Captain, Squadron Commander, 594th Ground Attack Regiment
VASIL'CHENKO, A. A.	3/27/42	Lieutenant, Deputy Squadron Commander, 316th Air Observation Regiment
VASIL'CHENKO, A. G.		
VASIL'CHENKO, V. V.	5/1/43	Senior Sergeant, Flier, 33rd Guards Ground Attack Regiment
VASIL'CHUK, A. D.	6/29/45	Junior Lieutenant, Flier, 75th Guards Ground Attack Regiment
BASIN, N. A.	8/18/45	Lieutenant, Flight Commander 62nd Ground Attack Regiment
BASIN, V. P.		
VAS'KO, A. F.	5/15/46	Lieutenant, Flier, 176th Guards Fighter Regiment
VAKHLAYEV, A. A.	7/1,44	Captain, Squadron Commander, 728th Fighter Regiment
VDOVENKO, I. T.	6/20/42	Junior Lieutenant, Flier, 81st Air Regiment Long-Range Aviation
VEDENEYEV, V. I.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 159 h Fighter Regiment
VELIKORODNYY, I. N.	2/23/45	Master Sergeant, Radio Gunner, Combat Training Directorate of the Air Force

VERBITSKIY, A. YE.	5/15/46	Captain, Craft Commander, 27th Guards Bomber Regiment
VERBITSKIY, M. K.	1/22/44	Captain, Flight Commander, 118th Air Observation Regiment Air Forces Northern Fleet
VEREVKIN, V. T.	10/26/44	Captain, Squadron Commander, 155th Guards Ground Attack Regiment
VERNIKOV, YA. I.	11/18/44	Captain, Deputy Commander for Aerial Gunnery Service, 147th Guards Air Regiment
VERNYAYEV, A. YA.	3/13/44	Senior Lieutenant, Detachment Navigator, 4th Guards Air Regiment Long-Range Aviation
VERKHOLANTSEV, V. A.	5/15/46	Major, Deputy Commander, 98th Independent Air Observation Regiment /513
VERSHININ, K. A.	8/19/44	General Colonel of Aviation, Commander of the 4th Air Army
VETROV, V. M.	4/19/45	Senior Lieutenant, Squadron Commander, 136th Guards Ground Attack Regiment
VIKTOROV, G. P.	4/19/45	Senior Lieutenant, Deputy Squadron Commander, 74th Guards Ground Attack Regiment
VIL'YAMSON, A. A.	6/27/45	Captain, Squadron Commander, 104th Guards Fighter Regiment
VINOGRADOV, I. N.	2/4/44	Captain, Squadron Commander, 235th Ground Attack Regiment
VINOGRADOV, L. V.	4/7/40	Captain, Squadron Military Commissar, 85th Air Regiment
VITKOVSKIY, I. P.	2/23/45	Major, Squadron Commander, 66th Guards Fighter Regiment
VITRUK, A. N.	2/24/42	Lieutenant Colonel, Commander, 65th Ground Attack Regiment
VIKHOREV, A. V.	9/18/43	Major, Aircraft Commander, 890th Air Regiment Long-Range Aviation
VISHENKOV, V. M.	4/13/44	Senior Lieutenant, Flight Commander, 8th Independent Long-Range Air Reconnaissance Regiment

Lower Page Source
NASA

VISHNEVETSKIY, K. G.	8/24/43	Senior Lieutenant, Squadron Commander, 298th Fighter Regiment
VISHNYAKOV, I. A.	2/23/48	Major, Deputy Commander, 171st Guards Fighter Regiment
VLADIMIROV, M. G.	11/5/44	Captain, Squadron Navigator, 108th Air Regiment Long-Range Aviation
VLASOV, I. P.	3/21/40	Captain, Squadron Commander, 50th High Speed Bomber Regiment
VLASOV, N. I.	11/23/42	Lieutenant Colonel, Senior Inspector for the Fighter Aviation Inspectorate of the Air Force
VOVNA, P. A.	4/7/40	Captain, Squadron Commander, 2nd High Speed Bomber Regiment
VODOP'YANOV, M. V.	4/20/34	Colonel, Polar Aviation Pilot
VOZDVIZHENSKIY, N. N.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 62nd Ground Attack Regiment
VOYTEKAYTES, A. N.	6/29/45	Major, Commander, 166th Guards Ground Attack Regiment
VOYTENKO, S. YE.	11/5/44	Major, Deputy Commander, 6th Guards Fighter Regiment Air Force Black Sea Fleet
VOLGIN, V. L.	4/13/44	Captain, Squadron Commander, 78th Guards Ground Attack Regiment
VOLKOV, V. F.	7/1/44	Major, Commander, 157th Fighter Regiment
VOLKOV, D. P.	9/18/43	Captain, Squadron Navigator, 3rd Air Regiment, Long-Range Aviation
VOLKOV, I. S.	7/1/44	Captain, Squadron Navigator, 60th Guards Night Bomber Regiment
VOLOVODOV, B. N.	11/17/43	Lieutenant, Squadron Commander, 47th Ground Attack Regiment Air Force Black Sea Fleet
VOLODIN, A. I.	2/23/48	Captain, Deputy Squadron Commander, 164th Fighter Regiment
VOLODIN, S. YE.	10/26/44	Lieutenant Colonel, Commander, 143rd Guards Ground Attack Regiment

Cover Page Source
NASA

VOLOSEVICH, I. I.	4/21.40	Battalion Commissar, Deputy Commander for Political Affairs, 11th Fighter Regiment Air Force Black Sea Fleet
VOLOSHIN, A. I.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 107th Guards Fighter Regiment
VOLYNKIN, I. T.	11/5/44	Captain, Deputy Squadron Commander, 36th Mine Torpedo Air Regiment Air Force Northern Fleet
VOROB'YEV, I. G.	10/26/44	Captain, Deputy Squadron Commander, 190th Ground Attack Regiment /514
VOROB'YEV, I. I.	5/15/46	Major, Squadron Navigator, 18th Guards Bomber Regiment Long-Range Aviation
VORONIN, I. F.	9/14/45	Captain, Squadron Commander, 37th Ground Attack Regiment, Air Force Pacific Ocean Fleet
VORONKOV, V. R.	5/15/46	Lieutenant, Flight Commander, 190th Guards Ground Attack Regiment
VORONKOV, M. M.	3/21/40	Captain, Squadron Commander, 50th High Speed Bomber Regiment
VORONOV, V. F.	8/24/43	Major, Navigator, 214th Ground Attack Division
VORON'KO, A. G.	2/23/45	Major, Squadron Commander, 63rd Guards Air Regiment
VOROPAYEV, V. N.	3/13/44	Captain, Detachment Commander, 4th Guards Air Regiment Long-Range Aviation
VOROTNIK, S. G.	8/2/44	Captain, Squadron Commander, 503rd Ground Attack Regiment
VOSTRUKHIN, P. M.	5/1/43	Junior Lieutenant, Flier, 271st Fighter Regiment
VYBORNOV, A. I.	6/27/45	Senior Lieutenant, Squadron Commander, 728th Fighter Regiment
VYDRIGAN, N. Z.	5/15/46	Senior Lieutenant, Flight Commander, 31st Guards Fighter Regiment
VYSOTSKIY, P. I.	11/2/44	Major, Squadron Commander, 80th Bomber Regiment
VYAZOVSKIY, V. A.	3/13/44	Captain, Squadron Navigator, 24th Guards Air Regiment Long-Range Aviation

Cover Page Source
(4")
NASA

GAVRILENKO, L. I.	6/29/45	Lieutenant, Flight Commander, 167th Guards Ground Attack Regiment
GAVRILIN, P. F.	5/15/46	Lieutenant, Flight Commander, 402nd Fighter Regiment
GAVRILOV, V. S.	2/23/45	Lieutenant, Deputy Commander for Aerial Gunnery Service, 218th Ground Attack Regiment
GAVRILOV, V. N.	2/22/43	Sergeant, Aerial Bombardier Gunner, 25th Air Regiment Air Force Northern Fleet
GAVRILOV, V. YA.	5/1/43	Major, Commander, 804th Bomber Regiment
GAVRILOV, P. I.	9/2/43	Major, Squadron Commander, 99th Guards Air Observation Regiment
GAVRILOV, T. K.	3/13/44	Captain, Squadron Commander, 102nd Air Regiment Long-Range Aviation
GAVRISH, I. F.	4/19/45	Senior Lieutenant, Flight Commander, 74th Guards Ground Attack Regiment
GAVRYSH, I. YE.	6/20/42	Captain, Flight Commander, 21st Air Regiment Long-Range Aviation
GAGARIN, YU. A.		Major, Cosmonaut
GAGIYEV, A. M.	3/6/45	Lieutenant, Flight Commander, First Mine Torpedo Air Regiment Air Force Red Banner Baltic Fleet
GAZIZULIN, I. G.	7/1/44	Senior Lieutenant, Deputy Squadron Commander, 667th Ground Attack Regiment
GALLAY, M. L.		Engineer, Colonel
GALANOV, G. V.	5/15/46	Lieutenant, Flight Commander, 91st Guards Ground Attack Regiment
GALITSKIY, B. K.		Colonel
GALKIN, M. P.	3/27/42	Lieutenant, Flight Commander, 4th Fighter Regiment
GALKIN, P. A.	8/19/44	Lieutenant, Flight Navigator, 9th Mine Torpedo Air Regiment Air Force Northern Fleet
GAL'CHENKO, L. A.	6/6/42	Major, Squadron Commander, 145th Fighter Regiment

Cover Page Source
NASA

GAYDARENKO, S. S.	2/22/39	Major, Detachment Commander, 10th High Speed Bomber Squadron
GAMAYUN, V. I.	4/13/44	Lieutenant, Flier, 235th Ground Attack Regiment
GAMZIN, V. V.	2/23/45	Captain, Deputy Commander, 74th Guards Ground Attack Regiment
GAPEYENOK, N. I.	6/27/45	Captain, Deputy Squadron Commander, 81st Guards Bomber Regiment /515
GAPONENKO, D. V.		Lieutenant Colonel
GARAM, M. A.	2/22/43	Senior Lieutenant, Flier, 32nd Guards Fighter Regiment
GARANIN, A. D.	12/31/42	Captain, Flight Commander, 2nd Guards Air Regiment, Long-Range Aviation
GARANIN, V. I.	3/27/42	Junior Lieutenant, Deputy Squadron Commander, 254th Fighter Regiment
GARIN, B. I.	2/4/44	Captain, Squadron Commander, 617th Ground Attack Regiment
GARKUSHA, K. D.	10/9/43	Senior Lieutenant, Squadron Commander, 907th Fighter Regiment
GASTELLO, N. F.	7/26/41	Captain, Squadron Commander, 207th Long-Range Bomber Regiment Long-Range Aviation
GATAULLIN, A.	8/18/45	Senior Lieutenant, Flight Commander, 99th Independent Air Observation Regiment
GASHEVA, R. S.	2/23/45	Senior Lieutenant, Squadron Navigator, 46th Guards Night Bomber Regiment
GASHKOV, A. V.	6/29/45	Lieutenant, Flight Navigator, 386th Night Bomber Regiment
GARNAYEV, YU. A.		Senior Lieutenant
GEYBO, I. I.	4/28/45	Colonel, Commander, 6th Guards Fighter Division
GELETA, V. A.	6/27/45	Senior Lieutenant, Squadron Navigator, 797th Bomber Regiment

GEL'MAN, P. V.	5/15/46	Senior Lieutenant, Chief of Squadron Communications, 46th Guards Night Bomber Regiment
GERASIMOV, I. N.	10/26/44	Captain, Deputy Squadron Commander, 809th Ground Attack Regiment
GERASIMOV, N. S.	2/22/39	Major, Pilot Technique Inspector, 23rd Fighter Regiment
GERASIMOV, S. D.	8/19/44	Major, Squadron Commander, 136th Guards Ground Attack Regiment
GERBINSKIY, P. YA.		
GERMAN, G. I.	9/28/43	Senior Lieutenant, Deputy Squadron Commander, 42nd Fighter Regiment
GERMAN, I. M.	8/24/43	Captain, Squadron Commander, 70th Guards Ground Attack Regiment
GES', G. I.		Captain
GET'MAN, S. G.	10/4/41	Major, Commander, 4th Ground Attack Regiment
GIRICH, A. I.	2/23/45	Major, Squadron Commander, 486th Fighter Regiment
GLASKOV, P. P.	3/29/42	Major, Squadron Commander, 750th Air Regiment Long-Range Aviation
GLAZOV, I. M.	8/19/44	Lieutenant, Deputy Squadron Commander, 17th Guards Aerial Regiment Long-Range Aviation
GLAZOV, N. YE.	5/1/43	Lieutenant, Deputy Squadron Commander, 31st Guards Fighter Regiment
GLAZUNOV, P. A.	2/23/45	Captain, Deputy Commander, 955th Ground Attack Regiment
GLAZYKIN, N. G.	8/29/39	Major, Commander, 22nd Fighter Regiment
GLEBOV, M. M.	8/18/45	Captain, Deputy Squadron Commander, 11th Independent Long-Range Air Reconnaissance Regiment
GLINKA, B. B.	5/24/43	Lieutenant, Squadron Aide, 45th Fighter Regiment
GERASIMOV, F. F.	6/15/42	Lieutenant, Flight Commander, 6th Guards Air Regiment Air Force Black Sea Fleet

GLINKIN, S. G.	2/4/44	Lieutenant, Flight Commander, 5th Guards Fighter Regiment	
GLINSKIY, S. N.	6/29/45	Major, Squadron Commander, 34th Guards Bomber Regiment	/516
GLOBIN, N. I.	6/29/45	Senior Lieutenant, Flight Commander, 525th Ground Attack Regiment	
GLOTOV, N. I.	6/27/45	Junior Lieutenant, Flight Commander, 129th Guards Fighter Regiment	
GLUKHIKH, I. M.	5/1/43	Captain, Navigator, 271st Fighter Regiment	
GLUSHKOV, N. N.	9/18/43	Lieutenant, Aircraft Navigator, 4th Guards Air Regiment Long-Range Aviation	
GLUSHKOV, I. V.	4/19/45	Major, Squadron Commander, 10th Independent Air Observation Regiment	
GLUSHCHENKO, L. P.	9/18/43	Captain, Assistant Senior Navigator, 3rd Guards Air Division Long-Range Aviation	
FLYGA, G. S.	6/27/45	Major, Navigator, 81st Guards Bomber Regiment	
GNEDOY, A. A.	3/6/45	Captain, Deputy Squadron Commander, 40th Air Regiment Air Force Black Sea Fleet	
GNEZDILOV, I. F	8/19/44	Senior Lieutenant, Deputy Squadron Commander, 153rd Guards Fighter Regiment	
GLIDO, P. A.	5/1/43	Lieutenant, Squadron Commander, 13th Fighter Regiment	
GOVORUNOV, N. M.	6/29/45	Lieutenant, Flier, 995th Ground Attack Regiment	
GOVORUKHIN, L. A.	5/15/46	Major, Navigator, 525th Ground Attack Regiment	
GODOVIKOV, A. N.	3/4/42	Junior Political Officer, Squadron Military Commissar, 740th Fighter Regiment	
GOLDOBIN, N. I.	11/1/43	Senior Lieutenant, Deputy Squadron Commander, 61st Night Bomber Regiment	
GOLIMBNEVSKIY, A. A.	7/1/44	Senior Lieutenant, Squadron Commander, 175th Ground Attack Regiment	

GOLITSYN, A. V.	6/27/45	Major, Commander, 82nd Guards Bomber Regiment
GOLOBACHEV, S. D.		Colonel
GOLOVASHKO, F. P.		Major
GOLOVIN, P. G.	6/27/37	Commander of an N-166 Aircraft, Main Directorate of the Northern Sea Route
GOLOVKO, P. F.	6/29/45	Senior Lieutenant, Deputy Squadron Commander, 951st Ground Attack Regiment
GOLOVKOV, G. P.	4/13/44	Senior Lieutenant, Deputy Squadron Commander, 807th Ground Attack Regiment
GOLODNYAK, P. M.	6/29/45	Major, Navigator, 277th Ground Attack Division
GOLUBEV, V. F.	10/23/42	Captain, Squadron Commander, 4th Guards Fighter Regiment Air Force Red Banner Baltic Fleet
GOLUBEV, G. G.	6/27/45	Senior Lieutenant, Flight Commander, 16th Guards Fighter Regiment
GOLUBEV, L. A.	3/13/44	Captain, Detachment Navigator, 7th Guards Air Regiment Long-Range Aviation
GOLUBEV, S. V.	6/29/45	Senior Lieutenant, Navigator, 167th Guards Ground Attack Regiment
GOLUBIN, I. F.	3/4/42	Lieutenant, Deputy Squadron Commander, 16th Fighter Regiment Air Defense
GOLUBNICHIY, I. P.	5/15/46	Captain, Deputy Squadron Commander, 47th Independent Air Observation Regiment
GOLUBOV, A. YE.	6/29/45	Lieutenant Colonel, Deputy Commander, 303rd Fighter Division
GOLUBOY, A. M.	8/18/45	Junior Lieutenant, Chief of Squadron Communications, 16th Guards Bomber Regiment
GOLYACHKOV, L. D.	5/15/46	Major, Navigator, 181st Guards Fighter Regiment
GOLCHIN, I. K.	6/27/45	Captain, Squadron Commander, 140th Guards Ground Attack Regiment

GOMANENKO, N. V.	6/20/42	Lieutenant, Observation Pilot, 81st Air Regiment Long-Range Aviation	
GONCHAR, I. A.	6/27/45	Senior Lieutenant, Flight Commander, 89th Guards Fighter Regiment	/517
GONCHAROV, L. A.	6/6/42	Lieutenant Colonel, Commander, 131st Fighter Regiment	
GONCHAROV, YA. I.	5/15/46	Senior Lieutenant, Chief of Squadron Communications, 96th Guards Bomber Regiment	
GONCHARUK, V. A.	2/10/43	Lieutenant, Gunner Bombardier, 44th High Speed Bomber Regiment	
VOPNIK, KH. M.	6/27/45	Major, Navigator, 948th Fighter Regiment	
GORANOV, V. S.	12/31/36	Colonel, Squadron Commander	
GORBATYUK, YE. M.	3/4/42	Senior Lieutenant, Squadron Commander, 28th Fighter Regiment Air Defense	
GORBACHEV, M. N.	3/13/44	Senior Lieutenant, Detachment Commander, 11th Guards Air Regiment Long-Range Aviation	
GORBACHEVSKIY, A. I.	2/4/44	Captain, Deputy Squadron Commander, 29th Guards Fighter Regiment	
GORBKO, YU. N.	3/21/40	Captain, Squadron Commander, 50th High Speed Bomber Regiment	
GORBUNOV, A. M.	5/1/43	Lieutenant, Gunner Bombardier, 367th Bomber Regiment	
GORBUNOV, I. M.	9/2/43	Senior Lieutenant, Deputy Squadron Commander 42nd Guards Fighter Regiment	
GORBUNOV, N. I.	8/2/44	Captain, Squadron Commander, 31st Fighter Regiment	
GORGALYUK, A. I.	9/2/43	Senior Lieutenant, Flight Commander, 30th Guards Fighter Regiment	
GOREGLYAD, L. 1.	2/23/48	Lieutenant Colonel, Commander, 22nd Guards Fighter Division	
GORELIK, YE. I.	6/29/45	Senior Lieutenant, Squadron Navigator, 251st Guards Bomber Regiment Long-Range Aviation	
GORELOV, S. D.	10/26/44	Captain, Deputy Squadron Commander, 111th Guards Fighter Regiment	

GORIN, A. S.	5/15/46	Senior Lieutenant, Deputy Commander, 451st Ground Attack Regiment
GORIN, V. A.	5/15/46	Lieutenant, Squadron Navigator, 15th Independent Air Observation Regiment Air Force Red Banner Baltic Fleet
GORKUNOV, M. S.	5/1/43	Captain, Deputy Squadron Commander, 367th High Speed Bomber Regiment
GOROVETS, A. K.	9/28/43	Senior Lieutenant, Deputy Squadron Commander, 88th Guards Fighter Regiment
GORODNICHEV, N. P.	5/5/42	Major, Deputy Squadron Commander, 5th Guards Fighter Regiment
GOROKHOV, YU. I.	2/4/44	Captain, Squadron Commander, 162nd Fighter Regiment
GORYUNOV, S. K.	4/28/45	General-Colonel of Aviation, Commander of the 5th Air Army
GORYAYNOV, N. I.		Lieutenant Colonel
GORYACHEV, V. F.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 7th Guards Ground Attack Regiment
GORYACHKIN, T. S.	5/15/46	Senior Lieutenant, Flight Commander, 99th Independent Air Observation Regiment
GOFMAN, G. B.	10/26/44	Senior Lieutenant, Deputy Commander, 622nd Ground Attack Regiment
GRAZHDANINOV, P. A.	5/1/43	Lieutenant, Flight Commander, 169th Fighter Regiment
GRATSIANSKIY, A. N.		
GRACHEV, A. I.	11/5/44	Captain, Flight Commander, 15th Independent Air Observation Regiment Air Force Red Banner Baltic Fleet
GRACHEV, A. A.	2/4/44	Senior Lieutenant, Deputy Squadron Commander, 272nd Fighter Regiment
GRACHEV, V. G.	8/18/45	General-Major of Aviation, Commander of the 2nd Special Air Division /518
GRACHEV, I. P.	1/16/42	Junior Lieutenant, Deputy Squadron Commander, 191st Fighter Regiment

GREBENEV, A. D.	10/26/44	Captain, Navigator, 111th Guards Fighter Regiment
GREKOV, L. I.	12/27/41	Captain, Deputy Commander, 169th Fighter Regiment
GRECHISHKIN, V. K.	2/20/42	Senior Lieutenant, Flight Commander, 748th Air Regiment Long-Range Aviation
GRECHISHKIN, V. N.	2/4/44	Major, Squadron Commander, 34th Guards Bomber Regiment
GRECHISHNIKOV, V. A.	8/13/41	Captain, Squadron Commander, First Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
GRIB, M. I.	10/23/42	Senior Lieutenant, Flight Commander, 6th Guard Air Regiment Air Forces Black Sea Fleet
GRIGOR'YEV, G. A.	2/14/43	Captain, Deputy Squadron Commander, 178th Fighter Regiment Air Defense
GRIGOR'YEV, I. I.	6/27/45	Senior Lieutenant, Squadron Commander, 93rd Guards Ground Attack Regiment
GRIZODUBOVA, V. S.	11/2/38	Major, Commander of the "Rodina" Aircraft
GRIDANSKIY, A. I.	5/6/65	Lieutenant, Deputy Squadron Commander, 144th Guards Ground Attack Regiment
GRINEV, N. V.	11/17/39	Lieutenant, Deputy Squadron Commander, 22nd Fighter Regiment
GRIN'KO, I. U.	10/26/44	Captain, Deputy Squadron Commander, 190th Ground Attack Regiment
GRISHAYEV, I. I.	8/18/45	Lieutenant, Deputy Squadron Commander, 569th Ground Attack Regiment
GRISHIN, A. N.	6/27/45	Captain, Squadron Commander, 153rd Guards Fighter Regiment
GRISHKO, K. YE.	6/27/45	Major, Squadron Commander, 143rd Guards Ground Attack Regiment
GRISHCHENKO, P. L.	7/1/44	Lieutenant, Flight Commander, 32nd Fighter Regiment
GROMAKOVSKIY, V. A.	5/15/46	Senior Lieutenant, Flight Commander, 176th Guards Fighter Regiment

GROMOV, G. V.	5/15/46	Lieutenant Colonel, Commander, 515th Fighter Regiment	
GROMOV, M. M.	9/28/34	Colonel, Detachment Commander, Central Hydrodynamic Institute	
GROSUL, I. T.	9/18/43	Captain, Deputy Squadron Commander, 10th Guards Air Regiment Long-Range Aviation	
GROSHEV, A. I.	6/29/45	Lieutenant, Flight Commander, 995th Ground Attack Regiment	
GROSHEV, L. P.	5/15/46	Captain, Squadron Navigator, 20th Guards Bomber Regiment Long-Range Aviation	
GROSHEV, N. P.	8/18/45	Senior Lieutenant, Squadron Commander, 214th Ground Attack Regiment	
GRUZDIN, A. I.	11/26/41	Senior Lieutenant, Pilot for the Civil Air Fleet	
GRYAZNOV, K. V.	3/24/45	Senior Lieutenant, Deputy Squadron Commander, 206th Independent Air Observation Regiment	
GUBANOV, A. A.	8/24/43	Captain, Squadron Commander, 13th Fighter Regiment	
GUBANOV, G. P.	2/21/40	Major, Commander, 72nd Air Regiment	
GUBANOV, M. G.	3/6/45	Senior Lieutenant, Flight Navigator, 12th Guards Fight Regiment Air Forces Red Banner Baltic Fleet	
GUBENKO, A. A.	2/22/39	Colonel, Flier for the Air Force of the Belorussian Military District	
GUBIN, YE. I.	7/1/44	Lieutenant, Flier, 218th Ground Attack Regiment	
GUBIN, N. P.	1/16/42	Sergeant, Aerial Radio Gunnery, 125th Bomber Regiment	
GUBRIY, A. A.	4/21/40	Captain, Deputy Commander, 18th Squadron Air Forces Red Banner Baltic Fleet	
GUGNIN, N. P.	5/15/46	Major, Navigator, 122nd Fighter Regiment	/519
GUDIMOV, I. K.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 448th Ground Attack Regiment	

GUDKOV, D. V.	6/29/45	Major, Squadron Commander, 976th Fighter Regiment
GUL'KIN, I. T.	2/4/44	Junior Lieutenant, Flier, 667th Ground Attack Regiment
BUL'TYAYEV, G. K.	2/8/43	Lieutenant, Deputy Squadron Commander, 788th Fighter Regiment
BULYAYEV, N. S.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 80th Guards Bomber Regiment
GULYAYEV, S. A.	7/22/44	Captain, Squadron Commander, 46th Ground Attack Regiment Air Forces Northern Fleet
GUNBIN, N. A.	8/19/44	Captain, Squadron Navigator, 10th Guards Air Regiment Long-Range Aviation
GURBICH, S. I.	10/26/44	Lieutenant, Deputy Squadron Commander, 451st Ground Attack Regiment
GURGENIDZE, A. YE.	3/6/45	Captain, Squadron Commander, 7th Guards Fighter Regiment Air Forces Red Banner Baltic Fleet
GUROV, K. F.	8/18/45	Captain, Squadron Commander, 657th Ground Attack Regiment
GUSAROV, N. M.	2/4/44	Major, Navigator, 486th Fighter Regiment
GUSEV, A. I.	11/14/38	Major, Deputy Air Brigade Commander
GUSENKO, P. YA.	10/26/44	Captain, Squadron Commander, 81st Guards Bomber Regiment
GUSLEV, G. D.	4/7/40	Master Sergeant, Aerial Radio Gunner, 31st High Speed Bomber Regiment
GUS'KOV, G. G.	5/24/43	Junior Lieutenant, Flight Commander, 65th Guards Fighter Regiment
GUTOROV, M. I.	5/15/46	Captain, Squadron Commander, 98th Independent Aerial Spotting Reconnaissance Regiment
GUTSALOV, A. S.	5/15/46	Captain, Navigator, 845th Fighter Regiment
GUCHEK, F. I.	6/27/45	Senior Lieutenant, Flight Commander, 100th Guards Fighter Regiment

GUSHCHIN, B. P.	9/18/43	Captain, Wing Navigator, 5th Guards Air Regiment Long-Range Aviation	
DAVIDENKO, G. I.	1/22/44	Lieutenant, Flight Navigator, 15th Air Observation Regiment	
DAVIDENKO, S. P.	2/4/44	Captain, Squadron Navigator, 24th Bomber Regiment	
DAVIDKOV, V. I.	6/6/42	Captain, Deputy Commander, 131st Fighter Regiment	
DAVYDENKO, K. S.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 62nd Ground Attack Regiment	
DAVYDOV, A. D.	11/5/44	Captain, Squadron Commander, 337th Air Regiment Long-Range Aviation	
DAVYDOV, V. K.	12/31/42	Captain, Deputy Squadron Commander, 5th Guards Air Regiment Long-Range Aviation	
DAVYDOV, V. I.	5/15/46	Captain, Deputy Squadron Commander, 72nd Independent Air Observation Regiment	
DAVYDOV, K. I.	8/18/45	Captain, Squadron Commander, 657th Ground Attack Regiment	
DAVYDOV, N. S.	4/19/45	Senior Lieutenant, Deputy Squadron Commander, 75th Guards Ground Attack Regiment	
DAVYDOV, S. S.	7/22/44	Captain, Squadron Navigator, 12th Guards Air Regiment Air Forces Red Banner Baltic Fleet	
DANILENKO, N. N.	4/19/45	Captain, Deputy Squadron Commander, 18th Guards Fighter Regiment	
DANILIN, S. A.	9/1/37	Military Engineer 3rd Class, Navigator for ANT-25 Aircraft	/520
DANILOV, A. V.	6/27/45	Lieutenant, Flight Commander, 161st Guards Bomber Regiment	
DANILOV, G. S.	5/1/43	Senior Sergeant, Flier, 807th Ground Attack Regiment	
DANILOV, S. P.	11/17/39	Major, Flight Commander, 121st Air Squadron	
DANIL'CHENKO, I. A.	7/1/44	Captain, Navigator, 237th Ground Attack Regiment	

DANSHCHIN, S. P.	3/25/43	Captain, Flight Commander, 2nd Guards Air Regiment Long-Range Aviation
DAN'KIN, A. F.	11/5/44	Major, Flight Navigator, 5th Guards Air Regiment Long-Range Aviation
DANYUSHIN, N. A.	8/18/45	Master Sergeant, Aerial Radio Gunner, 4th Guards Bomber Regiment
DATSENKO, I. I.	9/18/43	Senior Lieutenant, Flight Commander, 10th Guards Air Regiment Long-Range Aviation
DVORNIKOV, G. T.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 167th Guards Ground Attack Regiment
DEVYATAYEV, M. P.	8/15/57	Senior Lieutenant, Flight Commander, 104th Guards Fighter Regiment
DEVYAT'YAROV, A. A.	4/10/45	Major, Deputy Commander for Aerial Gunnery Service, 140th Guards Ground Attack Regiment
DEGTYAREV, V. A.	5/16/44	Major, Deputy Regiment Commander, 119th Bomber Regiment Air Forces Black Sea Fleet
DEGTYAR', N. I.	6/27/45	Major, Squadron Commander, 95th Guards Ground Attack Regiment
DEYNEKO, S. P.	5/24/43	Captain, Deputy Squadron Commander, 367th Bomber Regiment
DILIGEY, N. K.	7/1/44	Major, Commander, 508th Fighter Regiment
DEL'TSOV, P. A.	4/13/44	Captain, Squadron Commander, 24th Bomber Regiment
DELYAPUAP ROLLAND	11/27/44	Senior Lieutenant, Fligher for the 1st "Normandia-Neman" Regiment
DEMA, L. V.	10/26/44	Captain, Deputy Regiment Commander for Aerial Gunnery Service, 112th Guards Fighter Regiment
DEMENKOV, S. V.	9/28/43	Senior Lieutenant, Deputy Squadron Commander, 103rd Guards Fighter Regiment
DEMENT'YEV, YE. I.	6/29/45	Lieutenant, Flier, 167th Guards Ground Attack Regiment

DEMEKHIN, A. V.	4/13/44	Lieutenant, Flight Commander, 503rd Ground Attack Regiment
DEMIDOV, V. A.	4/19/45	Senior Lieutenant, Flight Commander, 10th Independent Air Observation Regiment
DEMIDOV, V. A.	10/26/44	Captain, Squadron Commander, 7th Guards Ground Attack Regiment
DEMIDOV, R. S.	3/6/45	Lieutenant, Flight Navigator, 1st Guards Mine Torpedo Air Regiment, Air Forces Red Banner Baltic Fleet
DEMCHENKOV, F. T.	4/12/42	Junior Lieutenant, Flight Commander, 150th High Speed Bomber Regiment
DENISENKO, V. G.	7/1/44	Lieutenant, Flight Commander, 32nd Fighter Regiment
DENICHENKO, G. K.	5/15/46	Lieutenant, Deputy Squadron Commander, 235th Ground Attack Regiment
DENISOV, A. A.	4/21/40	Major, Commander, 120th Squadron Air Forces Red Banner Baltic Fleet
DENISOV, G. M.	6/29/45	Major, Deputy Commander, 683rd Ground Attack Regiment
DENISOV, K. D.	10/23/42	Lieutenant Colonel, Commander, 7th Air Regiment of the Air Forces Black Sea Fleet
DENCHIK, N. F.	2/4/44	Senior Lieutenant, Deputy Squadron Commander, 64th Guards Fighter Regiment
DERGACH, A. N.	2/4/44	Senior Lieutenant, Deputy Squadron Commander, 86th Guards Fighter Regiment /521
DERYABIN, A. N.	4/19/45	Lieutenant, Flight Commander, 15th Guards Ground Attack Regiment
DESNITSKIY, P. P.	12/31/36	Junior Commander, Radio Gunner, 92nd Aerial Squadron
DEKHTYARENKO, A. N.	7/21/42	Senior Lieutenant, Squadron Commander, 580th Fighter Regiment
DZHABIDZE, D. V.	5/15/46	Captain, Squadron Commander, 812th Fighter Regiment
DZHIBELLI, P. A.	12/31/36	Test pilot

DZHINCHARADZE, I. K.	2/4/44	Junior Lieutenant, Senior Pilot, 673rd Ground Attack Regiment
DZHUNKOVSKAYA (MARKOVA) G. I.	8/18/45	Senior Lieutenant, Squadron Navigator, 125th Guards Bomber Regiment
DZUSOV, I. M.	5/29/45	General-Major of Aviation, Commander of the 6th Fighter Corps
DZYUBA, I. M.	7/21/42	Major, Squadron Commander, 12th Fighter Regiment
DZYUBA, P. P.	11/1/43	Captain, Deputy Commander for Aerial Gunnery Service, 85th Guards Fighter Regiment
DIDENKO, G. V.	4/10/45	Major, Commander, 482nd Fighter Regiment
DIDENKO, N. M.	11/5/45	Senior Lieutenant, Deputy Squadron Commander, 2nd Guards Mine Laying Regiment Air Forces, Northern Fleet
DIKIY, M. P.	5/1/43	Captain, Chief of the Aerial Gunnery Service, 236th Fighter Division
DMITRIYEV, N. P.	8/24/43	Guards Captain, Squadron Commander, 5th Guards Fighter Regiment
DMITRYUK, G. F.	11/2/44	Senior Lieutenant, Squadron Commander, 19th Guards Fighter Regiment
DOBKEVICH, A. A.	4/13/44	Captain, Squadron Commander, 61st Ground Attack Regiment
DOBROVOL'SKIY, YU. A.		
DOBRODETSKIY, A. V.	2/4/44	Junior Lieutenant, Flier, 297th Fighter Regiment
DOGADAYLO, A. D.	5/15/46	Senior Lieutenant, Flight Commander, 177th Guards Fighter Regiment
DOGAYEV, V. I.	10/26/44	Senior Lieutenant, Squadron Commander, 622nd Ground Attack Regiment
DODONOV, A. S.	3/25/43	Major, Squadron Commander, 746th Air Regiment, Long-Range Aviation
DOYCHEV, V. P.	4/19/45	Senior Lieutenant, Flight Commander, 75th Guards Ground Attack Regiment

DOKASHENKO, N. G.		Captain
DOKUNIN, I. A.	2/8/43	Lieutenant, Deputy Squadron Commander, 504th Ground Attack Regiment
DOKUCHALOV, P. S.	5/15/46	Senior Lieutenant, Flight Commander, 175th Guards Ground Attack Regiment
DOLGARYEV, P. M.	6/29/45	Lieutenant, Flight Commander, 116th Fighter Regiment
DOLGOV, I. I.	6/29/45	Lieutenant, Flier, 715th Ground Attack Regiment
DOLGOV, P. I.		Colonel
DOLGUSHIN, S. F.	5/5/42	Lieutenant, Squadron Commander, 180th Fighter Regiment
BOLZHANSKIY, N. I.	10/26/44	Lieutenant, Flier, 165th Guards Ground Attack Regiment
DOLINA, M. I.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 125th Guards Bomber Regiment
DOLINSKIY, S. A.	8/18/45	Junior Lieutenant, Flier, 569th Ground Attack Regiment /522
DOMBROVSKIY, I. A.	8/18/45	Captain, Deputy Commander for Aerial Gunnery Service, 167th Guards Ground Attack Regiment
DOMINKOV, V. M.	6/29/45	Captain, Squadron Navigator, 34th Guards Bomber Regiment
DONCHUK, V. I.	11/2/44	Major, Commander, 108th Independent Air Observation Squadron
DORONIN, I. V.	4/20/34	Captain, Student at the N. Ye. Zhukovskiy Academy
DOROSHENKO, P. YA.	7/1/44	Senior Lieutenant, Deputy Squadron Commander, 955 Ground Attack Regiment
DRAGOMIRETSKIY, V. P.	11/5/44	Major, Commander, 337th Air Regiment Long-Range Aviation
DRANISHCHEV, YE. P.	8/24/43	Senior Lieutenant, Deputy Squadron Commander, 9th Guards Fighter Regiment

DRANKO, P. A.	9/2/43	Major, Squadron Commander, 89th Guards Fighter Regiment
DRACHENKO, I. G.	10/26/44	Junior Lieutenant, Flier, 140th Guards Ground Attack Regiment
DRUZDEV, N. I.	9/14/45	Captain, Commander, 32nd Air Regiment Air Forces Pacific Ocean Fleet
DRYGIN, V. M.	5/24/43	Captain, Flier, 298th Fighter Regiment
DUBENKO, A. V.	10/26/44	Senior Lieutenant, Squadron Commander, 622nd Ground Attack Regiment
DUBENOK, G. S.	8/24/43	Captain, Squadron Commander, 53rd Guards Fighter Regiment
DUGIN, N. D.	5/15/46	Captain, Deputy Squadron Commander, 402nd Fighter Regiment
DUDAKOV, A. V.	2/23/48	Guards Major, Squadron Commander, 15th Guards Air Regiment Long-Range Aviation
DUDIN, N. M.	10/22/41	Lieutenant, Squadron Military Commissar, 29th Fighter Regiment
DUDKIN, A. P.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 166th Guards Ground Attack Regiment
DUDNIK, F. F.	9/18/43	Captain, Flight Navigator, 5th Guards Air Regiment Long-Range Aviation
DUDNICHENKO, V. M.	7/1/44	Senior Lieutenant, Deputy Squadron Commander 239th Fighter Regiment
DUNAYEV, N. P.	9/2/43	Captain, Squadron Commander, 270th Fighter Regiment
DUNAYEVSKIY, K. D.	8/18/45	Senior Lieutenant, Flight Commander, 47th Independent Air Observation Regiment
DUPLIY, S. P.	11/5/44	Major, Navigator, 5th Guards Air Regiment Air Forces Black Sea Fleet
DURAKOV, V. F.	6/29/45	Major, Navigator, 999th Ground Attack Regiment
DURNOVTSEV, A. YE.		Lieutenant Colonel

DUSHKIN, I. YE.	9/18/43	Senior Lieutenant, Flight Commander, 10th Guards Air Regiment Long-Range Aviation
DUSHKIN, I. I.	3/14/38	Major, Navigator-Inspector for the Air Forces of the Red Army
DYMCHENKO, P. L.	2/14/43	Lieutenant, Deputy Squadron Commander, 659th Fighter Regiment
D'YAKOV, P. M.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 683rd Ground Attack Regiment
D'YAKONOV, N. N.	2/4/44	Lieutenant, Deputy Squadron Commander, 672nd Ground Attack Regiment
D'YACHENKO, I. M.	8/18/45	Captain, Squadron Commander, 237th Ground Attack Regiment
D'YACHKOV, A. A.	5/15/46	Senior Lieutenant, Flier, 179th Guards Fighter Regiment
YEVGRAFOV, V. N.	8/19/44	Lieutenant, Flier, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet /523
YEVDOKIMOV, V. V.	8/19/44	Major, Squadron Commander, 6th Guards Air Regiment Long-Range Aviation
YEVDOKIMOV, G. P.	8/18/45	Captain, Squadron Navigator, 449th Bomber Regiment
YEVSEV'YEV, I. I.	10/28/37	Senior Lieutenant, Detachment Commander, 34th Squadron
YEVSEYEV, YE. A.	2/8/43	Lieutenant, Flier, 629th Fighter Regiment Air Defense
YEVSYUKOV, N. A.	7/1/44	Senior Lieutenant, Squadron Commander, 66th Ground Attack Regiment
YEVTEYEV, M. I.	9/28/43	Captain, Squadron Commander, 11th Guards Fighter Regiment
YEGOROV, A. A.	6/27/45	Captain, Navigator, 212th Guards Fighter Regiment
YEGOROV, B. B.		Cosmonaut
YEGOROV, V. V.	6/29/45	Senior Lieutenant, Flight Commander, 21st Fighter Regiment

YEGOROV, V. M.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 92nd Ground Attack Regiment
YEGOROV, N. S.	5/15/46	Senior Lieutenant, Squadron Commander, 150th Guards Fighter Regiment
YEGOROV, P. V.	10/26/44	Captain, Navigator, 62nd Ground Attack Regiment
YEGOROVICH, V. A.	5/15/46	Captain, Squadron Commander, 402nd Fighter Regiment
YEDKIN, V. D.	8/18/45	Major, Navigator, 72nd Guards Fighter Regiment
YEZHOV, YE. M.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 43rd Guards Ground Attack Regiment
YEZERSKIY, D. S.	6/29/45	Senior Lieutenant, Aircraft Commander for Transportation Squadron Long-Range Aviation
YELDYSHEV, A. A.	10/9/43	Lieutenant, Flier, 910th Fighter Regiment Air Defense
YELDYSHEV, A. P.	8/18/45	Captain, Squadron Commander, 995th Ground Attack Regiment
YELETSKIKH, G. N.	7/1/44	Captain, Squadron Navigator, 8th Independent Air Observation Regiment
YELIZAROV, S. M.	6/29/45	Senior Lieutenant, Flight Commander, 9th Guards Fighter Regiment
YELISEYEV, N. T.	6/27/45	Major, Navigator, 142nd Guards Ground Attack Regiment
YELOKHIN, A. A.	2/10/42	Senior Lieutenant, Squadron Commander, 69th Fighter Regiment
YEL'KIN, V. I.	8/22/44	Junior Lieutenant, Flight Commander, 908th Fighter Regiment Air Defense
YEL'KIN, L. I.	1/22/44	Captain, Acting Squadron Commander, 118th Reconnaissance Regiment Air Forces Northern Fleet
YEMEL'YANENKO, V. B.	4/13/44	Captain, Navigator, 7th Guards Ground Attack Regiment

YEMEL'YANOV, I. A.	8/24/43	Major, Commander, 622nd Ground Attack Regiment
YERASHOV, I. M.	2/4/44	Major, Commander, 672nd Ground Attack Regiment
YEREMENKO, I. T.	10/28/37	Captain, Detachment Commander, 119th Squadron
YEREMIN, A. K.	8/19/44	Captain, Squadron Commander, 15th Guards Ground Attack Regiment
YEREMIN, A. U.	6/27/45	Lieutenant Colonel, Commander, 355th Fighter Regiment
YEREMIN, B. D.	6/20/42	Lieutenant, Flight Navigator, 21st Air Regiment Long-Range Aviation
YEREMIN, I. A.	8/18/45	Junior Lieutenant, Flight Commander, 103rd Ground Attack Regiment
YERLYKIN, YE. YE.	3/21/40	Colonel, Commander, 59th Fighter Brigade /524
YERMAKOV, A. S.	6/29/45	Lieutenant, Deputy Squadron Commander, 525th Ground Attack Regiment
YERMAKOV, V. YE.	6/27/45	Lieutenant, Flight Commander, 109th Guards Ground Attack Regiment
YERMAKOV, D. V.	2/23/45	Lieutenant, Flight Commander, 159th Fighter Regiment
YERMAKOV, I. I.	2/23/45	Senior Lieutenant, Flight Commander, 91st Guards Ground Attack Regiment
YERMILOV, P. A.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 766th Ground Attack Regiment
YERMOLAYEV, V. I.	4/10/45	Lieutenant, Flier, 143rd Guards Ground Attack Regiment
YEROMASOV, P. F.	1/20/43	Senior Lieutenant, Aircraft Commander, Air Regiment Long-Range Aviation
YEROFEYEVSKIY, A. P.	11/4/44	Major, Squadron Commander, 717th Bomber Regiment
YEROSHENKO, V. I.	6/27/45	Major, Deputy Commander, 35th Bomber Regiment

YERSHOV, V. A.	5/15/46	Senior Lieutenant, Flier, 16th Independent Long-Range Air Reconnaissance Regiment
YERYASHEV, B. N.	8/2/44	Lieutenant, Flight Commander, 503rd Ground Attack Regiment
YESAULENKO, N. S.	8/18/45	Senior Lieutenant, Squadron Commander, 210th Ground Attack Regiment
YESIPOV, P. V.	6/27/45	Lieutenant, Deputy Squadron Commander, 93rd Guards Ground Attack Regiment
YEFIMOV, I. N.	6/29/45	Senior Lieutenant, Flight Commander, 565th Ground Attack Regiment
YEFIMOV, M. A.	6/14/42	Senior Lieutenant, Flight Commander, 3rd Guards Fighter Regiment
YEFIMOV, M. YE.	6/14/42	Senior Lieutenant, Flight Commande , 18th Air Regiment Air Forces Black Sea Fleet
YEFFEMOV, A. YA.	8/13/41	Captain, Squadron Commander, 1st Air Regiment Air Forces Red Banner Baltic Fleet
YEFREMOV, V. V.	5/5/42	Captain, Deputy Squadron Commander, 5th Guards Fighter Regiment
YEFREMENKO, I. S.	5/24/43	Junior Lieutenant, Aerial Gunner, 805th Ground Attack Regiment
ZHABINSKIY, D. I.	10/26/44	Captain, Squadron Commander, 75th Guards Ground Attack Regiment
ZHELEZNYAKOV, P. F.	6/27/45	Captain, Squadron Commander, 108th Guards Ground Attack Regiment
ZHELTUKHIN, P. N.	2/23/45	Captain, Squadron Commander, 136th Guards Ground Attack Regiment
ZHERDEV, N. P.	11/17/39	Captain, Flight Commander, 41st Fighter Regiment
ZHERDIY, YE. N.	11/5/42	Lieutenant, Flight Commander, 273rd Fighter Regiment
ZHESTKOV, A. I.	11/5/44	Senior Lieutenant, Flight Commander, 5th Guards Mine Torpedo Air Regiment Air Forces Black Sea Fleet
ZHIVOLUP, M. A.	9/28/43	Lieutenant Colonel, Commander, 126th Guards Bomber Regiment

ZHIGARIN, F. A.	9/8/43	Senior Lieutenant, Squadron Commander, 299th Ground Attack Regiment
ZHIGULENKO. YE. A.	2/23/45	Lieutenant, Flight Commander, 46th Guards Night Bomber Regiment
ZHIGULENKOV, P. V.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 178th Guards Fighter Regiment
ZHIGUNOV, V. R.	6/27/45	Lieutenant, Flight Commander, 140th Guards Ground Attack Regiment
ZHIDOV, G. N.	2/14/43	Captain, Squadron Commander, 123rd Fighter Regiment Air Defense
ZHIKHAREV, V. D.	4/13/44	Major, Squadron Commander, 74th Guards Ground Attack Regiment /525
ZHMAYEV, N. R.	6/27/45	Master Sergeant, Chief of Squadron Communications, 36th Guards Bomber Regiment
ZHMURKO, I. M.	5/15/46	Captain, Squadron Navigator, 35th Guards Bomber Regiment
ZHOLUDEV, L. V.	8/18/45	Captain, Squadron Commander, 35th Guards Bomber Regiment
ZHOROV, S. V.	8/18/45	Junior Lieutenant, Flier, 569th Ground Attack Regiment
ZHUGAN, N. P.	8/19/44	Captain, Flight Commander, 10th Guards Air Regiment Long-Range Aviation
ZHUKANOV, N. A.	8/18/45	Junior Lieutenant, Flight Commander, 783rd Ground Attack Regiment
ZHUKOV, M. P.	7/8/41	Junior Lieutenant, Flier, 158th Fighter Regiment
ZHUKOV, S. I.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 58th Guards Ground Attack Regiment
ZHULOV, F. YE.	10/26/44	Junior Lieutenant, Deputy Squadron Commander, 235th Ground Attack Regiment
ZHURAVKOV, M. V.	8/19/44	Captain, Flight Commander, 13th Guards Air Regiment, Long-Range Aviation
ZHURAVLEV, V. A.	2/23/48	Major, Navigator, 339th Air Regiment Long-Range Aviation

ZHURAVLEV, I. P.	4/7/40	Major, Squadron Commander, 85th Regiment
ZHURBA, I. T.	2/23/45	Senior Lieutenant, Flight Commander, 237th Ground Attack Regiment
ZHURCHENKO, G. P.	2/23/45	Senior Lieutenant, Flight Commander, 237th Ground Attack Regiment
ZHUCHKOV, T. S.	3/5/45	Senior Lieutenant, Deputy Squadron Commander, 3rd Guards Fighter Regiment Air Forces Red Banner Baltic Fleet
ZABALUYEV, V. M.	5/29/45	General-Major of Aviation, Commander, 2nd Fighter Corps
ZABEGAYLO, I. I.	5/24/43	Senior Lieutenant, Squadron Commander, 1st Guards Fighter Regiment
ZABOLOTNYY, I. N.	3/4/42	Senior Lieutenant, Flight Commander, 16th Fighter Regiment Air Defense
ZABYRIN, N. V.	6/27/45	Lieutenant, Flight Commander, 106th Guards Fighter Regiment
ZAVADSKIY, V. G.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 511th Independent Air Observation Regiment
ZAVARIN, G. A.	3/6/45	Major, Navigator, 51st Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
ZAVARYKIN, I. A.	4/13/44	Captain, Deputy Commander, 806th Ground Attack Regiment
ZAVORYZGIN, B. S.	2/23/45	Senior Lieutenant, Deputy Commander for Aerial Gunnery Service, 76th Guards Ground Attack Regiment
ZAVRAZHNOV, I. D.	9/28/43	Lieutenant Colonel, Commander, 72nd Independent Air Observation Regiment
ZADKOV, V. N.		
ZAYEVSKIY, V. A.	2/23/45	Captain, Deputy Squadron Commander, 392nd Night Bomber Regiment
ZAIKIN, S. YA.	6/29/45	Lieutenant, Flight Commander, 6th Guards Independent Ground Attack Regiment
ZAYKIN, I. M.	3/29/42	Major, Deputy Commander, 750th Air Regiment Long-Range Aviation

ZAYTSEV, A. A.	11/17/39	Captain, Commander, 70th Fighter Regiment
ZAYTSEV, A. D.	2/4/44	Senior Lieutenant, Deputy Commander, 707th Night Bomber Regiment
ZAYTSEV, B. M.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 783rd Ground Attack Regiment
ZAYTSEV, V. A.	8/18/45	Lieutenant, Flight Commander, 828th Ground Attack Regiment
ZAYTSEV, V. V.	6/27/45	Major, Squadron Commander, 482nd Fighter Regiment /526
ZAYTSEV, V. G.	2/23/45	Senior Lieutenant, Squadron Commander, 723rd Ground Attack Regiment
ZAYTSEV, D. A.	8/2/41	Junior Lieutenant, Flight Commander, 2nd Fighter Regiment
ZAYTSEV, D. M.	5/15/46	Lieutenant, Flier, 91st Guards Ground Attack Regiment
ZAYTSEV, N. I.	2/22/44	Senior Lieutenant, Deputy Squadron Commander, 9th Guards Mine Torpedo Air Regiment Air Forces Northern Fleet
ZAYTSEV, N. I.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 208th Ground Attack Regiment
ZAYTSEV, N. S.	6/27/45	Lieutenant Colonel, Commander, 80th Guards Bomber Regiment
ZAYTSEV, N. YA.	6/29/45	Senior Lieutenant, Flight Commander, 996th Ground Attack Regiment
ZAKLEPA, K. P.	4/19/45	Lieutenant Colonel, Commander, 311th Ground Attack Division
ZALEVSKIY, V. N.	1/30/43	Lieutenant, Flight Commander, 157th Fighter Regiment
ZAMYATIN, I. P.		Captain
ZANIN, I. D.	8/18/45	Captain, Squadron Commander, 312th Ground Attack Regiment
ZAPADINSKIY, A. S.	2/4/44	Senior Lieutenant, Observation Pilot, 118th Independent Long-Range Air Reconnaissance Squadron

ZARETSKIKH, M. A.	6/29/45	Lieutenant, Flier, 525th Ground Attack Regiment
ZAROVNYAYEV, A. I.	6/29/45	Senior Lieutenant, Flight Commander, 76th Guards Ground Attack Regiment
ZARUBIN, V. S.	5/15/46	Senior Lieutenant, Squadron Commander, 451st Ground Attack Regiment
ZAKHAROV, V. N.	7/1/44	Senior Lieutenant, Squadron Commander, 995 Ground Attack Regiment
ZAKHAROV, G. N.	4/19/45	General-Major of Aviation, Commander, 303rd Fight Division
ZAKHAROV, K. F.	8/2/44	Captain, Squadron Commander, 233rd Fighter Regiment
ZAKHAROV, L. P.	6/29/45	Senior Lieutenant, Squadron Commander, 999th Ground Attack Regiment
ZAKHAROV, M. K.	8/2/44	Captain, Deputy Commander, 807th Ground Attack Regiment
ZAKHAROV, N. S.	6/29/45	Senior Lieutenant, Navigator, 166th Guards Ground Attack Regiment
ZAKHAROV, S. I.	3/25/43	Senior Lieutenant, Flight Commander, 752nd Air Regiment Long-Range Aviation
ZAKHARCHENKO, M. D.	8/18/45	Lieutenant Colonel, Commander, 175th Ground Attack Regiment
ZATSEPA, L. G.	2/23/45	Major, Navigator, 571st Ground Attack Regiment
ZVER'KOV, P. P.	5/15/46	Captain, Deputy Commander for Aerial Gunnery Service, 41st Ground Attack Regiment
ZVEREV, V. V.	2/22/39	Senior Lieutenant, Student at the Military Technical Aviation School
ZVYAGIN, A. YE.	5/15/46	Lieutenant, Flier, 208th Ground Attack Regiment
ZDOROVTSEV, S. I.	7/8/41	Junior Lieutenant, Flight Commander, 158th Fighter Regiment
ZEVAKHIN, M. S.	2/4/44	Senior Lieutenant, Flight Commander, 11th Independent Air Observation Regiment

ZELENKIN, M. M.	5/15/46	Senior Lieutenant, Flight Commander, 156th Fighter Regiment	
ZELENOV, N. A.	2/10/43	Captain, Deputy Squadron Commander, 154th Fighter Regiment	
ZELENTSOV, V. V.	4/7/40	Major, Commander, 68th Fighter Regiment	
ZEMLYANSKIY, V. V.	11/5/42	Major, Commander, 622nd Ground Attack Regiment	/527
ZEMSKIKH, V. A.	8/18/45	Lieutenant, Squadron Commander, 569th Ground Attack Regiment	
ZELENTSOV, V. V.		Lieutenant Colonel	
ZIBOROV, V. M.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 72nd Guards Fighter Regiment	
ZIMIN, G. V.	9/28/43	Colonel, Commander, 240th Fighter Division	
ZINOV'YEV, I. I.	6/27/45	Captain, Squadron Commander, 108th Guards Ground Attack Regiment	
ZINCHENKO, A. R.	9/2/43	Senior Lieutenant, Squadron Commander, 448th Ground Attack Regiment	
ZINCHENKO, V. N.	8/18/45	Lieutenant, Flier, 166th Guards Ground Attack Regiment	
ZINCHENKO, N. A.	3/21/40	Junior Lieutenant, Flier, 50th Bomber Regiment	
ZLYDENNYY, I. D.	8/19/44	Senior Lieutenant, Observation Pilot, 99th Guards Independent Air Observation Regiment	
ZNAMENSKIY, V. I.	5/15/46	Senior Lieutenant, Flight Commander, 187th Guards Ground Attack Regiment	
ZOZULYA, G. P.	5/15/46	Lieutenant, Flier, 43rd Guards Ground Attack Regiment	
ZOLIN, I. L.	6/6/42	Senior Lieutenant, Deputy Squadron Commander 242nd Short-Range Bomber Regiment	
ZOLOTAREV, S. P.	9/18/43	Major, Squadron Navigator, 5th Guards Air Regiment Long-Range Aviation	
ZOLOTUKHIN, B. A.	8/18/45	Captain, Squadron Commander, 502nd Ground Attack Regiment	

ZOTOV, V. A.	2/4/44	Senior Lieutenant, Deputy Squadron Commander, 159th Fighter Regiment
ZOTOV, M. I.	9/28/43	Major, Navigator, 427th Fighter Regiment
ZUB, N. A.	4/13/44	Lieutenant Colonel, Commander, 210th Ground Attack Regiment
ZUBANEV, N. I.	6/27/45	Lieutenant Colonel, Commander, 110th Guards Ground Attack Regiment
ZUBKO, P. N.	8/2/44	Captain, Squadron Commander, 951st Ground Attack Regiment
ZUBKOVA, A. L.	8/18/45	Senior Lieutenant, Squadron Navigator, 125th Guards Bomber Regiment
ZUDILOV, V. F.	8/2/44	Major, Squadron Commander, 809th Ground Attack Regiment
ZUDILOV, I. S.	5/5/42	Junior Lieutenant, Flight Commander, 163rd Fighter Regiment
ZUEV, G. P.	5/1/43	Captain, Deputy Squadron Commander, 427th Fighter Regiment
ZUEV, M. A.	2/4/44	Captain, Squadron Commander, 73rd Guards Fighter Regiment
ZUENKO, I. S.	5/15/46	Captain, Squadron Navigator, 108th Air Regiment, Long-Range Aviation
ZUMBULIDZE, B. Z.	6/29/45	Lieutenant Colonel, Commander, 406th Night Bomber Regiment
ZYKOV, YU. N.	7/1/44	Senior Lieutenant, Deputy Squadron Commander, 59th Guards Ground Attack Regiment
ZYUZIN, D. V.	5/16/44	Senior Lieutenant, Deputy Squadron Commander, 11th Guards Fighter Regiment Air Forces Black Sea Fleet
ZYUZIN, P. D.	11/2/44	Lieutenant, Deputy Squadron Commander, 29th Guards Fighter Regiment
IVANOV, A. A.	12/27/41	Senior Sergeant, Bombardier Gunner, 52nd Short-Range Bomber Regiment
IVANOV, A. V.	3/13/44	Captain, Deputy Squadron Commander, 455th Air Regiment

IVANOV, A. S.	6/29/45	Senior Lieutenant, Observation Pilot, 10th Independent Air Observation Regiment	/528
IVANOV, V. G.		Colonel	
IVANOV, V. K.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 160th Guards Bomber Regiment	
IVANOV, V. M.	2/4/44	Lieutenant, Flight Commander, 427th Fighter Regiment	
IVANOV, V. A.		Colonel	
IVANOV, V. P.	8/22/44	Captain, Squadron Commander, 148th Guards Fighter Regiment Air Defense	
IVANOV, V. A.	8/18/45	Senior Lieutenant, Flight Commander, 4th Guards Short-Range Bomber Regiment	
IVANOV, G. A.	4/19/45	General Major of Aviation, Commander, 11th Fighter Corps	
IVANOV, YE. N.	2/23/45	Captain, Squadron Commander, 999th Ground Attack Regiment	
IVANOV, I. I.	8/2/41	Senior Lieutenant, Flight Commander, 46th Fighter Regiment	
IVANOV, K. V.	2/23/45	Senior Lieutenant, Squadron Commander, 723rd Ground Attack Regiment	
IVANOV, L. I.	7/22/41	Senior Lieutenant, Squadron Commander, 147th Fighter Regiment	
IVANOV, L. P.	6/27/45	Captain, Squadron Commander, 193rd Independent Air Observation Regiment	
IVANOV, M. I.	8/18/45	Senior Lieutenant, Flight Commander, 657th Ground Attack Regiment	
IVANOV, M. I.		Colonel	
IVANOV, N. V.	2/23/45	Lieutenant, Flier, 59th Guards Ground Attack Regiment	
IVANOV, N. D.	7/22/44	Lieutenant, Flight Navigator, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet	
IVANOV, N. M.	10/26/44	Senior Lieutenant, Senior Observation Pilot, 50th Independent Air Observation Regiment	

IVANOV, N. P.	9/2/43	Lieutenant Colonel, Commander, 63rd Guards Fighter Regiment
IVANOV, P. M.	10/26/44	Lieutenant Colonel, Commander, 866th Fighter Regiment
IVANOV, S. A.	6/29/45	Lieutenant, Flight Commander, 74th Guards Ground Attack Regiment
IVANOV, S. G.	8/22/44	Major, Deputy Commander, 148th Guards Fighter Regiment Air Defense
IVANOV, YA. M.	1/17/42	Junior Lieutenant, Flier, 32nd Fighter Regiment Air Forces Black Sea Fleet
IVASHKIN, V. I.	2/22/43	Major, Deputy Squadron Commander, 608th Short-Range Bomber Regiment
IVLIYEV, YU. D.	10/26/44	Captain, Squadron Commander, 312th Ground Attack Regiment
IVCHENKO, V. I.	4/19/45	Senior Lieutenant, Flight Commander, 74th Guards Ground Attack Regiment
IGNAT'YEV, M. T.	8/24/43	Lieutenant, Deputy Squadron Commander, 13th Fighter Regiment
IGNAT'YEV, N. P.	4/13/44	Captain, Navigator, 728th Fighter Regiment
IGNASHKIN, G. I.	11/5/42	Lieutenant, Squadron Commander, 431st Ground Attack Regiment
IVASHCHENKO, I. T.		Major
IYEVSKIY, A. A.	6/29/45	Lieutenant, Flight Commander, 989th Ground Attack Regiment
IZHUTOV, N. S.	5/15/46	Captain, Deputy Regiment Commander, 108th Bomber Regiment
IKONNIKOV, V. D.	11/5/44	Captain, Deputy Squadron Commander, 30th Guards Air Regiment Long-Range Aviation
IL'IN, I. I.	5/16/44	Captain, Squadron Commander, 119th Air Regiment Air Forces Black Sea Fleet /529
IL'CHENKO, V. L.	6/29/45	Lieutenant, Flier, 75th Guards Ground Attack Regiment
IL'YUSHIN, V. S.		Captain

IL'YASHENKO, G. D.	9/14/45	Lieutenant, Flier, 4th Mine Torpedo Air Regiment Air Forces Pacific Ocean Fleet
INASARIDZE, G. M.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 683rd Ground Attack Regiment
INDYK, S. L.	6/27/45	Lieutenant Colonel, Commander, 107th Guards Fighter Regiment
IONOV, A. D.	6/29/45	Captain, Deputy Squadron Commander, 953rd Ground Attack Regiment
ISAYEV, V. V.	8/18/45	Captain, Deputy Squadron Commander, 42nd Guards Fighter Regiment
ISAYEV, N. V.	4/6/45	Colonel, Commander, 273rd Fighter Division
ISKRIN, N. M.	8/24/43	Senior Lieutenant, Deputy Squadron Commander, 16th Guards Fighter Regiment
ISTOMIN, V. V.	8/18/45	Junior Lieutenant, Flier, 783rd Ground Attack Regiment
ISTRASHKIN, V. I.	10/26/44	Major, Deputy Commander for Aerial Gunnery Service, 979th Fighter Regiment
ISHANKULOV, A.	8/18/45	Senior Lieutenant, Flight Commander, 62nd Ground Attack Regiment
ISHMUKHAMEDOV, T. K.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 43rd Guards Ground Attack Regiment
ISHCHENKO, V. K.	6/27/45	Major, Squadron Commander, 1st Guards Fighter Regiment
ISHCHENKO, N. A.	7/27/43	Major, Squadron Commander, 746th Air Regiment Long-Range Aviation
KABANOV, V. YE.	2/23/45	Lieutenant, Flier, 7th Guards Ground Attack Regiment
KABANOV, YE. I.	7/22/44	Senior Lieutenant, Flight Navigator, 12th Guards Bomber Regiment
KABANOV, K. M.	8/18/45	Lieutenant, Flier, 593rd Ground Attack Regiment
KABEROV, I. A.	7/24/43	Captain, Deputy Squadron Commander, 3rd Guards Fighter Regiment Air Forces Red Banner Baltic Fleet

KOBISKOY, A. S.	7/1/44	Senior Lieutenant, Flight Commander, 721st Fighter Regiment
KABISHEV, B. D.	2/23/45	Senior Lieutenant, Squadron Commander, 958th Ground Attack Regiment
KADOMTSEV, A. I.	4/13/44	Captain, Squadron Commander, 59th Guards Ground Attack Regiment
KAZAKOV, A. I.		Major
KAZAKOV, A. S.	5/15/46	Senior Lieutenant, Flight Commander, 235th Ground Attack Regiment
KAZAKOV, V. F.	5/15/46	Lieutenant, Flight Commander, 43rd Guards Ground Attack Regiment
KAZAKOV, M. N.	4/20/45	Senior Lieutenant, Flight Commander, 8th Guards Ground Attack Regiment
KAYKOV, P. A.	6/6/42	Lieutenant, Flier, 147th Fighter Regiment
KALABUSHKIN, I. N.	3/4/43	Senior Lieutenant, Squadron Commander, 562nd Fighter Regiment Air Defense
KALARASH, D. L.	12/13/42	Major, Navigator, 236th Fighter Division
KALACHEV, A. A.	6/29/45	Senior Lieutenant, Deputy Commander, 166th Guards Ground Attack Regiment
KALACHEV, V. N.	8/29/39	Senior Political Officer, Military Commissar, 22nd Fighter Regiment
KALASHINKOV, A. S.	10/26/44	Junior Lieutenant, Deputy Squadron Commander, 637th Ground Attack Regiment
KALENOV, N. A.	6/29/45	Lieutenant, Deputy Squadron Commander, 15th Guards Ground Attack Regiment /530
KALINA, A. D.		Lieutenant Colonel
KALININ, N. N.	2/4/44	Junior Lieutenant, Flier, 210th Ground Attack Regiment
KALINICHENKO, S. Z.	8/18/45	Captain, Squadron Navigator, 367th Bomber Regiment
KALINKIN, B. T.	6/20/44	Captain, Pilot for the 1st Aerotransport Division

KALYGIN, F. Z.	9/2/43	Lieutenant, Flight Commander, 42nd Guards Fighter Regiment
KAL'YAN, L. P.	4/21/43	Captain, Squadron Commander, 573rd Fighter Regiment Air Defense
KALYUZHNYY, P. P.	3/29/44	Major, Squadron Commander, 146th Guards Fighter Regiment Air Defense
KAMANIN, N. P.	4/20/34	Colonel, Student at the N. Ye. Zhukovskiy Academy
KAMEL'CHIK, M. S.	5/15/46	Senior Lieutenant, Flight Commander, 33rd Guards Ground Attack Regiment
KAMENSHCHIKOV, V. G.	8/9/41	Lieutenant, Squadron Aide, 126th Fighter Regiment
KAMINSKIY, I. I.	6/29/45	Senior Lieutenant, Flight Commander, 10th Independent Air Observation Regiment
KANAYEV, A. F.	6/15/46	Senior Lieutenant, Deputy Commander for Aerial Gunnery Service, 451st Ground Attack Regiment
KANAREV, V. P.	5/15/44	Lieutenant Colonel, Commander, 5th Guards Air Regiment Air Forces Black Sea Fleet
KANDYBIN, B. G.	8/19/44	Senior Lieutenant, Flight Commander, 237th Ground Attack Regiment
KANKOSHEV, A. T.	9/2/43	Lieutenant, Flight Commander, 42nd Guards Fighter Regiment
KAPITONOV, V. YE.	3/27/42	Senior Sergeant, Aerial Radio Gunner, 33rd Air Regiment
KAPRIN, D. V.	4/19/45	Captain, Squadron Commander, 74th Ground Attack Regiment
KAPUSTINKOV, N. I.	6/29/45	Lieutenant, Squadron Commander, 637th Ground Attack Regiment
KAPABULIN, N. M.	4/12/42	Lieutenant, Flight Commander, 215th Ground Attack Regiment
KARABUT, I. L.	2/4/44	Captain, Squadron Commander, 7th Guards Ground Attack Regiment
KARABAY, P. P.	8/18/45	Captain, Squadron Commander, 897th Fighter Regiment

KARAYEV, A. A.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 176th Guards Fighter Regiment
KARASEV, A. N.	8/24/43	Senior Lieutenant, Flight Commander, 9th Guards Fighter Regiment
KARASEV, A. A.	6/14/42	Captain, Deputy Squadron Commander, 57th Air Regiment
KARACHUN, V. G.	5/15/46	Captain, Squadron Commander, 947th Ground Attack Regiment
KARDANOV, K. L.	8/24/43	Captain, Deputy Squadron Commander, 88th Fighter Regiment
KARELIN, A. M.		Major
KARLOV, V. A.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 129th Guards Fighter Regiment
KARMANOV, A. G.	3/27/42	Captain, Squadron Commander, 4th Fighter Regiment
KARMISHIN, D. D.		Captain /531
KARNACH, S. A.	2/4/44	Captain, Navigator, 247th Fighter Regiment
KARNACHENOK, N. A.	11/23/42	Lieutenant, Flight Commander, 434th Fighter Regiment
KARPEYEV, M. P.	6/29/45	Lieutenant, Deputy Squadron Commander, 75th Guards Ground Attack Regiment
KARPENKO, A. P.	3/13/44	Major, Squadron Navigator, 5th Guards Air Regiment Long-Range Aviation
KARPENKO, I. T.	9/14/45	Major, Deputy Commander, 52nd Mine Torpedo Air Regiment Air Forces Pacific Ocean Fleet
KARPOV, A. A.	8/2/44	Senior Lieutenant, Squadron Commander, 806th Ground Attack Regiment
KARPOV, A. D.	3/6/45	Lieutenant, Flight Commander, 30th Independent Air Observation Regiment Air Forces Black Sea Fleet
KARPOVICH, V. P.	6/6/42	Senior Lieutenant, Flight Commander, 16th Guards Fighter Regiment
KARPUKHIN, M. T.	8/18/45	Captain, Deputy Squadron Commander, 175th Ground Attack Regiment

KAPUSHIN, A. F.	10/26/44	Lieutenant, Squadron Commander, 167th Guards Ground Attack Regiment
KAPYAKIN, V. G.	5/1/43	Captain, Navigator, 312th Ground Attack Regiment
KASPAROV, A. D.	11/5/44	Major, Squadron Navigator, 101st Air Regiment, Long-Range Aviation
KAS'KOV, K. A.	4/7/40	Master Sergeant, Radio Gunner, 54th High Speed Bomber Regiment
KATRICH, A. N.	10/28/41	Lieutenant, Squadron Commander, 12th Guards Fighter Regiment
KATUNIN, I. B.	5/31/44	Captain, Deputy Squadron Commander, 46th Ground Attack Regiment Air Forces Northern Fleet
KASHIRKIN, V. A.	8/19/44	Major, Squadron Navigator, 9th Guards Air Regiment Long-Range Aviation
KASHTANKIN, V. N.	5/31/44	Major, Deputy Commander, 7th Guards Ground Attack Regiment
KASHUBA, P. T.	11/26/41	Senior Lieutenant, Pilot for the 2nd Special Group
GVASHIN, I. F.	3/21/40	Senior Political Officer, Squadron Military Commissar, 58th Air Regiment
KIBALKO, V. V.	5/24/43	Captain, Deputy Squadron Commander, 10th Independent Long-Range Air Reconnaissance Regiment
KIBKALOV, M. M.	5/15/46	Senior Lieutenant, Flight Commander, 163rd Fighter Regiment
KIZIMA, A. I.	4/19/45	Senior Lieutenant, Squadron Commander, 943rd Ground Attack Regiment
KIZ', V. D.	2/4/44	Lieutenant, Flight Navigator, 97th Guards Night Bomber Regiment
KIZYUN, P. K.	6/29/45	Major, Deputy Commander for Aerial Gunnery Service, 525th Ground Attack Regiment
KILASONIYA, G. V.	6/29/45	Major, Navigator, 64th Ground Attack Regiment
KIN'DYUSHEV, I. I.	8/19/44	Major, Deputy Navigator, 26th Guards Air Regiment Long-Range Aviation

KIREYEV, A. I.	5/15/46	Lieutenant Colonel, Commander, 890th Ground Attack Regiment	
KIRILENKO, V. I.	10/26/44	Senior Lieutenant, Flight Commander, 98th Guards Independent Long-Range Air Reconnaissance Regiment	
KIRILLOV, A. S.	5/15/46	Captain, Squadron Commander, 41st Ground Attack Regiment	
KIRILLOV, M. M.	11/5/44	Major, Navigator, 337th Air Regiment Long-Range Aviation	
KIRILYUK, V. V.	2/23/45	Lieutenant, Flight Commander, 31st Fighter Regiment	
KIRIYA, SH. N.	10/26/44	Major, Navigator, 427th Fighter Regiment	/532
KIRSANOV, V. M.	8/18/45	Senior Lieutenant, Flight Commander, 502nd Ground Attack Regiment	
KIRSANOV, I. I.	5/15/46	Major, Squadron Commander, 20th Guards Air Regiment Long-Range Aviation	
KIRTOK, N. N.	6/27/45	Senior Lieutenant, Squadron Commander, 143rd Guards Ground Attack Regiment	
KIR'YANOV, K. A.	5/1/43	Senior Lieutenant, Squadron Commander, 875th Fighter Regiment	
KISILEV, V. A.	6/27/45	Captain, Squadron Commander, 4th Guards Ground Attack Regiment	
KISILEV, V. N.	7/24/43	Captain, Deputy Squadron Commander, 24th Air Regiment	
KISILEV, G. S.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 58th Guards Ground Attack Regiment	
KISILEV, I. M.	5/14/65	Senior Lieutenant, Flight Commander, 274th Fighter Regiment	
KISILEV, S. I.	2/4/44	Captain, Squadron Commander, 126th Fighter Regiment	
KISELENKO, P. YE.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 237th Ground Attack Regiment	
KISLYAK, N. A.	3/6/45	Captain, Navigator, 11th Guards Fighter Regiment Air Forces Black Sea Fleet	

KISLYAKOV, A. V.	8/18/45	Captain, Deputy Commander for Aerial Gunnery Service, 28th Guards Fighter Regiment
KITAYEV, N. M.	5/15/46	Senior Lieutenant, Squadron Commander, 3rd Dive Bomber Ground Attack Regiment
KITAYEV, N. T.	5/1/43	Senior Lieutenant, Squadron Commander, 40th Guards Fighter Regiment
KITSENKO, I. I.	3/6/45	Senior Lieutenant, Flight Commander, 5th Guards Air Regiment Air Forces Black Sea Fleet
KIYANCHENKO, N. S.	6/27/45	Major, Navigator, 106th Guards Fighter Regiment
KLEVTSOV, V. I.	7/7/40	Colonel, Deputy Commander in Chief of the Air Forces of the 13th Army
KLEVTSOV, I. V.	5/15/46	Lieutenant, Deputy Squadron Commander, 131st Guards Ground Attack Regiment
KLEPIKOV, N. F.	9/28/43	Captain, Navigator, 41st Guards Fighter Regiment
KLESHCH, I. N.		Major
KLESHCHEV, I. I.	5/5/42	Major, Commander, 521st Fighter Regiment
KLIMANOV, I. K.	2/23/45	Captain, Squadron Commander, 49th Fighter Regiment
KLIMENKO, M. G.	6/14/42	Senior Lieutenant, Flight Commander, 57th Air Regiment Air Forces Red Banner Baltic Fleet
KLIMOV, V. V.	5/15/46	Major, Navigator, 15th Fighter Regiment
KLIMOV, P. D.	7/24/43	Junior Lieutenant, Flight Commander, 2nd Guards Fighter Regiment Air Forces Northern Fleet
KLOCHKO, N. A.	6/29/45	Major, Instructor-Pilot, 276th Bomber Division
KLYUYEV, P. N.	2/23/45	Junior Lieutenant, Flight Commander, 503rd Ground Attack Regiment
KLYUSHKIN, A. S.	1/22/45	Senior Lieutenant, Squadron Aide, 36th Air Regiment Air Forces Black Sea Fleet

KLY[illegible]A, P. F.	8/19/44	Major, Squadron Commander, 6th Guards Air Regiment Long-Range Aviation	
KNYAZEV, V. A.	8/24/43	Senior Lieutenant, Squadron Commander, 88th Fighter Regiment	
KOBELEV, A. I.	8/2/44	Captain, Squadron Commander, 951st Ground Attack Regiment	/533
KOBZEV, A. M.	6/27/45	Junior Lieutenant, Flight Commander, 140th Guards Ground Attack Regiment	
KOBZEV, S. P.	11/2/44	Major, Squadron Commander, 17th Guards Ground Attack Regiment	
KOBLIKOV, A. N.	3/21/40	Battalion Commissar, Military Commissar, 25th Fighter Regiment	
KOBLOV, S. K.	2/14/43	Senior Lieutenant, Flight Commander, 182nd Fighter Regiment Air Defense	
KOBYLETSKIY, I. I.	5/15/46	Major, Deputy Commander, 53rd Guards Fighter Regiment	
KOBYLYANSKIY, I. A.	3/27/42	Sergeant, Gunner Bombardier, 289th Bomber Regiment	
KOVALEV, V. F.			
KOBALEV, V. YE.	3/4/42	Lieutenant, Flight Commander, 11th Fighter Regiment Air Defense	
KOVALEV, K. F.	1/22/44	Senior Lieutenant, Deputy Squadron Commander, 13th Fighter Regiment	
KOVALEV, T. A.	6/29/45	Major, Commander, 15th Night Bomber Regiment	
KOVALENKO, A. A.	6/14/42	Captain, Squadron Commander, 2nd Guards Fighter Regiment Air Forces Northern Fleet	
KOVALENKO, A. YA.	2/23/45	Senior Lieutenant, Observation Pilot, 742nd Independent Air Observation Regiment	
KOVALENKO, G. P.	10/26/44	Captain, Squadron Commander, 103rd Ground Attack Regiment	
KOVAL', D. I.	5/24/43	Lieutenant, Flier, 45th Fighter Regiment	
KOVAL'CHIK, S. M.	8/18/45	Captain, Squadron Commander, 683rd Ground Attack Regiment	

KOVAL'CHUK, I. I.	3/6/45	Captain, Squadron Navigator, 30th Observation Regiment Air Forces Black Sea Fleet
KOVANEV, I. F.	8/19/44	Major, Squadron Commander, 34th Guards Bomber Regiment
KOVATS, P. S.	4/12/42	Senior Lieutenant, Squadron Commander, 129th Fighter Regiment
KOVACHEVICH, A. F.	5/1/43	Senior Lieutenant, Squadron Commander, 9th Guards Fighter Regiment
KOVZAN, B. I.	8/24/43	Senior Lieutenant, Flier, 744th Fighter Regiment
KOVTUN, K. I.	12/31/36	Lieutenant, Flight Commander, 109th Fighter Division
KOVTYLEV, D. F.	1/30/43	Junior Lieutenant, Squadron Commander, 518th Fighter Regiment
KOVSHAROV, I. A.	12/17/41	Lieutenant, Squadron Navigator, 225th Short-Range Bomber Regiment
KOZHANOV, P. P.	10/23/42	Senior Lieutenant, Squadron Military Commissar, 4th Guards Fighter Regiment Air Forces Red Banner Baltic Fleet
KOZHEVNIKOV, A. L.	6/27/45	Major, Deputy Commander, 212th Guards Fighter Regiment
KOZHEMYAKIN, I. I.	3/21/40	Battalion Commissar, Squadron Military Commissar, 44th High Speed Bomber Regiment
KOZHEMYAKIN, M. S.	6/27/45	Major, Navigator, 38th Bomber Regiment
KOZHUSHKIN, N. A.	6/29/45	Lieutenant, Flier, 75th Guards Ground Attack Regiment
KOZACHENKO, P. K.	5/1/43	Major, Commander, 249th Fighter Regiment
KOZENKOV, V. G.	4/19/45	Senior Lieutenant, Squadron Commander, 136th Guards Ground Attack Regiment
KOZICH, I. S.	4/21/44	Master Sergeant, Deputy Squadron Commander, 721st Fighter Regiment
KOZLENKO, P. A.	5/15/46	Captain, Squadron Navigator, 24th Bomber Regiment

KOZLOV, A. V.	2/4/44	Senior Lieutenant, Flight Navigator, 118th Independent Long-Range Air Observation Squadron	/534
KOZLOV, V. G.	6/27/45	Major, Squadron Commander, 6th Bomber Regiment	
KOZLOV, V. V.	8/18/45	Junior Lieutenant, Flight Commander, 828th Ground Attack Regiment	
KOZLOV, G. F.	6/27/45	Major, Pilot Technique Inspector, 135th Ground Attack Regiment	
KOZLOV, I. D.	3/13/44	Major, Navigator, 101st Air Regiment Long-Range Aviation	
KOZLOV, M. D.	2/23/48	Major, Deputy Commander, 15th Guards Bomber Regiment Long-Range Aviation	
KOZLOV, N. A.	2/14/43	Captain, Squadron Commander, 788th Fighter Regiment Air Defense	
KOZLOVSKIY, V. I.	8/19/44	Captain, Squadron Commander, 810th Ground Attack Regiment	
KOZLOVSKIY, I. I.	8/18/45	Captain, Navigator, 996th Ground Attack Regiment	
KOZ'YAKOV, N. YE.	8/19/44	Captain, Flight Navigator, 10th Guards Air Regiment Long-Range Aviation	
KOYNASH, V. V.	3/21/40	Senior Political Officer, Squadron Military Commissar, 50th High Speed Bomber Regiment	
KOKKINAKI, K. K.		Lieutenant Colonel	
KOLBEYEV, A. N.	10/26/44	Major, Squadron Commander. 190th Ground Attack Regiment	
KOLENNIKOV, V. F.	2/23/45	Captain, Deputy Squadron Commander, 78th Guards Ground Attack Regiment	
KOLESNIK, V. A.	8/24/43	Captain, Squadron Commander, 88th Fighter Regiment	
KOLESNIK, P. A.	2/22/44	Senior Lieutenant, Flier, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet	
KOLESNIKOV, A. V.	2/4/44	Senior Lieutenant, Flier, 118th Independent Long-Range Air Observation Squadron	

KOLESNIKOV, A. N.	8/2/44	Captain, Squadron Commander, 232nd Ground Attack Regiment
KOLESNIKOV, K. I.	7/4/37	Captain, Detachment Commander, 107th Fighter Division
KOLESNIKOV, N. D.	11/5/44	Senior Lieutenant, Flight Commander, 12th Guards Fighter Regiment Air Forces Red Banner Baltic Fleet
KOLESNIKOV, P. G.	8/18/45	Major, Senior Navigator, 199th Ground Attack Division
KOLESNICHENKO, V. YE.	2/14/43	Junior Lieutenant, Pilot, 573rd Fighter Regiment
KOLESNICHENKO, S. K.	9/2/43	Lieutenant, Deputy Commander for Aerial Gunnery Service, 519th Fighter Regiment
GOLOGRIVOV, M. M.	11/5/44	Captain, Squadron Commander, 6th Guards Fighter Regiment Air Forces Black Sea Fleet
KOLODIN, A. I.	8/18/45	Lieutenant, Flier, 565th Ground Attack Regiment
KOLOMIETS, P. L.	11/5/44	Captain, Squadron Commander, 2nd Guards Fighter Regiment Air Forces Northern Fleet
KOLOMIN, P. I.	8/18/45	Lieutenant Colonel, Commander, 162nd Fighter Regiment
KOLOMOYETS, A. F.	10/26/44	Lieutenant, Deputy Squadron Commander, 74th Guards Ground Attack Regiment
KOLOMOYETS, V. N.	2/23/45	Captain, Squadron Commander, 49th Fighter Regiment
KOL'TSOV, A. I.	9/2/43	Major, Commander, 937th Fighter Regiment
KOLYADIN, V. I.	6/29/45	Senior Lieutenant, Squadron Commander, 68th Guards Fighter Regiment
KOMARDINKIN, K. P.	11/1/43	Senior Lieutenant, Deputy Squadron Commander, 274th Fighter Regiment
KOMARITSKIY, G. K.	2/23/45	Senior Lieutenant, Squadron Commander, 723rd Ground Attack Regiment
KOMAROV, V. S.	10/9/43	Major, Deputy Commander, 630th Fighter Regiment

KOMAROV, G. O.	5/29/45	General-Major of Aviation, Commander, 2nd Guards Ground Attack Division	/535
KOMAROV, S. P.	5/15/46	Lieutenant, Flier, 16th Independent Long-Range Air Observation Regiment	
KOMEL'KOV, M. S.	6/27/45	Captain, Deputy Commander, 104th Guards Fighter Regiment	
KOMENDAT, V. P.	8/18/45	Lieutenant, Flier, 502nd Ground Attack Regiment	
KOMLEV, P. A.	2/23/45	Senior Lieutenant, Flight Commander, 686th Ground Attack Regiment	
KOMOSA, A. S.	6/27/45	Major, Pilot-Inspector of Pilot Technique, 2nd Air Army	
KOMPANIYETS, A. P.	6/27/45	Major, Commander, 141st Guards Ground Attack Regiment	
KONDAKOV, V. A.	10/26/44	Major, Navigator, 136th Guards Ground Attack Regiment	
KONDRAT, YE. F.	5/1/43	Colonel, Commander, 2nd Guards Fighter Regiment	
KONDRATOVICH, N. U.	5/15/46	Captain, Squadron Commander, 322nd Bomber Regiment	
KONDRAT'YEV, P. V.	4/21/40	Captain, Deputy Commander, 13th Fighter Regiment	
KONDRATYUK, A. A.	5/5/42	Captain, Deputy Squadron Commander, 5th Guards Fighter Regiment	
KONDRASHOV, A. P.	7/1/44	Captain, Deputy Squadron Commander, 66th Guards Fighter Regiment	
KONDRASHIN, A. K.	5/31/44	Captain, Squadron Commander, 40th Air Regiment Air Forces Black Sea Fleet	
KONDRIN, S. F.	8/19/44	Major, Squadron Commander, 18th Guards Air Regiment Long-Range Aviation	
KONEV, G. N.	5/1/43	Lieutenant Colonel, Commander, 21st Guards Fighter Regiment	
KONIN, M. F.	8/2/44	Lieutenant, Flier, 93rd Guards Ground Attack Regiment	

KONKIN, M. P.	11/23/42	Senior Lieutenant, Squadron Commander, 4th Air Regiment
KONOBAYEV, V. S.	4/13/44	Junior Lieutenant, Deputy Squadron Commander, 291st Fighter Regiment
KONOVALOV, A. P.	3/13/44	Captain, Squadron Navigator, 42nd Air Regiment Long-Range Aviation
KONOVALOV, S. I.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 150th Guards Fighter Regiment
KONONENKO, V. I.	2/4/44	Captain, Flight Navigator, 10th Independent Air Observation Regiment
KONONENKO, N. N.	5/15/46	Captain, Navigator, 179th Guards Fighter Regiment
KONSTANTINOV, A. U.	5/15/46	Captain, Squadron Commander, 85th Guards Fighter Regiment
KONSTANTINOV, V. F.	4/13/44	Senior Lieutenant, Flight Navigator, 25th Guards Night Bomber Regiment
KONSTANTINOV, A. R.	5/15/46	Junior Lieutenant, Flier, 43rd Guards Ground Attack Regiment
KONSTANTINOVA, T. F.	6/29/45	Lieutenant, Deputy Squadron Commander, 999th Ground Attack Regiment
KONUKOYEV, N. T.	5/6/65	Reserve Lieutenant Colonel, Squadron Commander, 45th Fighter Regiment
KONYSHEV, N. S.	8/18/45	Major, Squadron Commander, 163rd Fighter Regiment
KONYUKHOV, S. S.	6/29/45	Lieutenant, Flight Commander, 995th Ground Attack Regiment
KONYAYEV, A. N.	10/26/44	Senior Lieutenant, Squadron Commander, 32nd Fighter Regiment
KONYAYEV, P. M.	6/27/45	Senior Lieutenant, Flight Commander, 482nd Fighter Regiment
KONYAKHIN, V. D.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 287th Fighter Regiment /536
KOPAYEV, G. I.	4/13/44	Major, Navigator, 59th Guards Ground Attack Regiment

KOPEYKIN, I. V.	2/23/45	Master Sergeant, Chief of Squadron Communications, 35th Guards Bomber Regiment
KOPETS, I. I.	6/21/37	Colonel, Deputy Commander of Troops for Aviation, Leningrad Military District
KOPTEV, M. I.	6/27/45	Lieutenant, Flight Commander, 144th Guards Ground Attack Regiment
KORZUNOV, I. YE.	7/24/43	Major, Squadron Commander, 40th Air Regiment Air Forces Black Sea Fleet
KORKOTSENKO, D. I.	5/15/46	Junior Lieutenant, Flight Commander, 873rd Ground Attack Regiment
KORNEV, A. S.	8/2/44	Major, Squadron Commander, 809th Ground Attack Regiment
KORNEYEV, I. A.	8/18/45	Major, Deputy Commander, 63rd Night Bomber Regiment
KORNIYENKO, I. M.	9/2/43	Captain, Squadron Commander, 270th Fighter Regiment
KORNILOV, B. A.	3/21/40	Lieutenant, Observation Pilot, 50th High Speed Bomber Regiment
KORNILOV, M. D.	8/18/45	Senior Lieutenant, Squadron Commander, 502nd Ground Attack Regiment
KOROBKIN, V. I.	4/12/42	Junior Lieutenant, Flier, 215th Ground Attack Regiment
KOROBKOV, P. T.	2/22/39	Captain, Instructor, 8th Air School
KOROBKOV, F. G.	6/14/42	General Major of Aviation, Deputy Commander of Naval Air Forces
KOROVIN, K. M.	5/15/46	Major, Deputy Commander for Aerial Gunnery Service, 637th Ground Attack Regiment
GOROVIN, N. A.		Lieutenant Colonel
KOROVIN, YA. I.	6/29/45	Major, Squadron Commander, 136th Guards Ground Attack Regiment
KOROVUSHKIN, N. I.		Lieutenant Colonel
KOROLEV, V. I.	2/22/43	Lieutenant, Flight Commander, 147th Fighter Regiment

KOROLEV, V. I.	6/27/45	Major, Flier-Inspector of Pilot Technique, 482nd Fighter Regiment
KOROLEV, I. G.	2/10/42	Lieutenant, Flight Commander, 69th Fighter Regiment
KOROLEV, M. G.	6/27/45	Major, Squadron Commander, 160th Guards Bomber Regiment
KOROSTELEV, A. K.	8/19/44	Senior Lieutenant, Deputy Squadron Commander, 8th Guards Air Regiment Long-Range Aviation
KOROTKOV, M. I.	2/14/43	Major, Squadron Commander, 241st Ground Attack Regiment
KORSUNSKIY, V. B.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 103rd Ground Attack Regiment
KORUNOV, I. M.	3/13/44	Captain, Squadron Navigator, 1st Guards Air Regiment Long-Range Aviation
KORCHAGIN, L. P.	4/19/45	Captain, Squadron Commander, 566th Ground Attack Regiment
KORSHUNOV, K. I.	2/4/44	Senior Lieutenant, Squadron Commander, 29th Guards Fighter Regiment
KORYAZIN, D. N.	6/6/42	Sergeant, Squadron Flier, 242nd Short Range Bomber Regiment
KORYAKOV, V. N.	8/18/45	Lieutenant Colonel, Commander, 91st Guards Ground Attack Regiment
KOSENKO, YU. KH.	5/31/44	Lieutenant, Flight Commander, 12th Guards Bomber Regiment Air Forces Red Banner Baltic Fleet
KOSINOV, S. K.	1/16/42	Lieutenant, Gunner Bombardier, 125th Bomber Regiment /537
KOSOLAPOV, V. I.	5/15/46	Captain, Squadron Commander, 594th Ground Attack Regiment
KOSOLAPOV, F. M.	9/2/43	Senior Lieutenant, Squadron Commander, 2nd Guards Fighter Regiment
KOSTENKO, M. F.	5/15/46	Captain, Squadron Commander, 336th Bomber Regiment
KOSTIKOV, F. M.	5/15/46	Senior Lieutenant, Flight Commander, 43rd Fighter Regiment

KOSTIN, V. N.	8/18/45	Captain, Deputy Regiment Commander for Aerial Gunnery Service, 811th Ground Attack Regiment
KOSTIN, L. N.	8/18/45	Captain, Deputy Commander for Aerial Gunnery Service, 811th Ground Attack Regiment
KOSTRIKIN, A. G.	9/28/43	Captain, Navigator, 224th Short-Range Bomber Regiment
KOSTYLEV, A. N.	3/21/40	Battalion Commissar, Military Commissar, 50th High-Speed Bomber Regiment
KOSTYLEV, G. D.	10/23/42	Senior Lieutenant, Flight Commander, 3rd Guards Fighter Regiment Air Forces Red Banner Baltic Fleet
KOSYAKIN, S. I.	3/21/40	Captain, Squadron Commander, 4th High-Speed Bomber Regiment
KOT, A. N.	8/19/44	Captain, Flight Navigator, 10th Guards Air Regiment Long-Range Aviation
KOTELKOV, A. N.	6/29/45	Captain, Deputy Squadron Commander, 336th Air Regiment Long-Range Aviation
KOTLOV, V. S.		Colonel
KOTLYAR, F. P.	6/29/45	General-Major of Aviation, Commander, 4th Guards Bomber Division
KOTOV, A. G.	2/22/43	Senior Lieutenant, Deputy Squadron Commander, 32nd Guards Fighter Regiment
KOTOV, I. S.		
KOTOV, I. D.	7/22/44	Major, Navigator, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
KOTYUNIN, V. A.	4/19/45	Senior Lieutenant, Deputy Squadron Commander, 15th Guards Ground Attack Regiment
KOKHOV, N. S.	2/23/45	Major, Navigator, 955th Ground Attack Regiment
KOTSEBA, G. A.	11/20/41	Lieutenant, Flight Commander for an Independent Air Squadron, 44th Fighter Division

KOCHELAYEVSKIY, YU. P.	5/31/44	Captain, Squadron Navigator, 9th Guards Mine Torpedo Air Regiment Air Forces Northern Fleet
KOCHERGIN, G. K.	4/17/43	Lieutenant, Flight Commander, 502nd Ground Attack Regiment
KOCHETKOV, A. G.		
KOCHETKOV, N. P.	11/5/42	Senior Lieutenant, Deputy Squadron Commander, 686th Ground Attack Regiment
KOCHETOV, A. V.	4/13/44	Senior Lieutenant, Squadron Commander, 43rd Fighter Regiment
KOCHETOV, V. I.	3/13/44	Senior Lieutenant, Detachment Navigator, 11th Guards Air Regiment Long-Range Aviation
KOCHETOV, I. D.	8/24/43	Senior Lieutenant, Squadron Commander, 70th Guards Ground Attack Regiment
KOCHMAREV, N. N.	8/2/44	Captain, Squadron Commander, 95th Guards Ground Attack Regiment
KOCHNEV, V. G.	8/19/44	Captain, Deputy Squadron Commander, 26th Guards Air Regiment Long-Range Aviation
KOSHEVOY, F. A.	3/6/45	Lieutenant, Flight Commander, 35th Ground Attack Regiment Air Forces Red Banner Baltic Fleet
KOSHELEV, V. N.	6/29/45	Lieutenant, Flight Commander, 136th Guards Ground Attack Regiment /538
KOSHELEV, P. L.	7/22/44	Captain, Squadron Navigator, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
KOSHEL', F. F.	9/18/43	Captain, Flight Navigator, 9th Guards Air Regiment Long-Range Aviation
KOSHUKOV, V. B.	4/13/44	Lieutenant, Deputy Squadron Commander, 622nd Ground Attack Regiment
KRAVTSOV, A. S.	2/23/45	Captain, Squadron Commander, 947th Ground Attack Regiment
KRAVTSOV, D. S.	8/18/45	Major, Squadron Commander, 31st Fighter Regiment

KRAVTSOV, I. S.	7/22/44	Senior Lieutenant, Flight Commander, 3rd Guards Fighter Regiment
KRAYEV, N. T.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 93rd Guards Ground Attack Regiment
KRAMARCHUK, G. V.	5/15/46	Lieutenant, Deputy Squadron Commander, 3rd Dive Bomber Ground Attack Regiment
GRAMORENKO, S. M.		Captain
KRAPIVA, N. A.	11/5/44	Major, Deputy Squadron Commander, 27th Guards Air Regiment Long-Range Aviation
KRAPIVNYY, F. A.	9/14/45	Junior Lieutenant, Acting Flight Commander, 37th Ground Attack Regiment
KRASAVIN, K. A.	5/15/46	Major, Deputy Commander, 150th Guards Fighter Regiment
KRASILOV, A. P.	5/15/46	Senior Lieutenant, Squadron Commander, 235th Ground Attack Regiment
KRASNOV, N. P.	3/13/44	Captain, Flight Commander, 10th Guards Air Regiment Long-Range Aviation
KRASNOV, N. F.	2/4/44	Major, Squadron Commander, 116th Fighter Regiment
KRASNOVSKIY, N. V.	10/26/44	Senior Lieutenant, Squadron Commander, 91st Guards Ground Attack Regiment
KRASNOLUTSKIY, M. P.	1/16/42	Major, Deputy Commander, 65th Ground Attack Regiment
KRASNOPEROV, S. L.	2/4/44	Junior Lieutenant, Flight Commander, 502nd Ground Attack Regiment
KRASNOYURCHENKO, N. N.	11/17/39	Lieutenant, Squadron Commander Aide, 22nd Fighter Regiment
KRASNYKHIN, A. M.	12/31/42	Major, Flight Commander, 2nd Guards Air Regiment Long-Range Aviation
KRASNYUKOV, I. I.	6/29/45	Captain, Squadron Navigator, 240th Bomber Regiment
KRASOVSKIY, S. A.	5/29/45	General Colonel of Aviation, Commander, 2nd Air Army

KRASOTA, G. T.	2/4/44	Senior Lieutenant, Squadron Commander, 667th Ground Attack Regiment
KRATINOV, S. YU.	4/10/45	Captain, Squadron Commander, 40th Guards Fighter Regiment
KRIVEN', P. YA.	10/26/44	Lieutenant, Senior Pilot, 7th Guards Ground Attack Regiment
KRIVOV, N. A.	2/4/44	Lieutenant, Deputy Squadron Commander, 61st Ground Attack Regiment
KRIVOLUTSKIY, N. YE.	5/15/46	Lieutenant, Flier, 98th Guards Independent Long-Range Air Observation Regiment
KRIVONOS, A. L.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 95th Guards Ground Attack Regiment
KRIVOROTCHENKO, S. D.	2/31/42	Major, Deputy Squadron Commander, 3rd Air Regiment Long-Range Aviation
KRIVORUCHENKO, A. N.	5/15/46	Major, Squadron Commander, 72nd Independent Air Observation Squadron /539
KRIVOSHEYEV, YE. A.	2/22/43	Lieutenant, Flight Commander, 19th Guards Fighter Regiment
KROKHALEV, A. I.	2/7/40	Captain, Squadron Commander, 10th Air Brigade Red Banner Baltic Fleet
KRUGLOV, P. M.	2/23/45	Captain, Navigator, 567th Ground Attack Regiment
KRUPIN, A. P.	5/1/43	Captain, Squadron Navigator, 99th Short-Range Bomber Regiment
KRUPSKIY, V. I.	2/22/43	Senior Lieutenant, Deputy Squadron Commander, 760th Fighter Regiment
KRUCHENYKH, S. P.	7/24/43	Major, Squadron Commander, 119th Air Regiment, Air Forces Black Sea Fleet
KRYUKOV, A. A.	11/5/44	Major, Squadron Commander, 33rd Guards Air Regiment Long-Range Aviation
KRYUKOV, K. A.	3/29/44	Senior Lieutenant, Squadron Commander, 12th Guards Fighter Regiment
KRYUKOV, N. V.	9/16/41	Captain, Squadron Commander, 53rd Long-Range Bomber Regiment

KRYUKOV, P. P.	5/24/43	Major, Navigator, 16th Guards Fighter Regiment
KRYUCHKOV, V. YE.	5/15/46	Captain, Squadron Commander, 163rd Fighter Regiment
KSENDZOV, G. V.	5/15/46	Captain, Squadron Navigator, 33rd Guards Air Regiment Long-Range Aviation
KUBAREV, V. N.	9/28/43	Major, Squadron Commander, 65th Guards Fighter Regiment
KUVSHINOV, A. K.	6/20/42	Captain, Flight Commander, 51st Air Regiment Long-Range Aviation
KUVSHINOV, L. M.		Colonel
KUDAR', P. S.	11/20/41	Lieutenant, Squadron Commander, 249th Fighter Regiment
KUDRYA, N. D.	5/24/43	Junior Lieutenant, Flier, 45th Fighter Regiment
KUDRYAVTSEV, V. V.	4/10/45	Lieutenant, Deputy Squadron Commander, 140th Guards Ground Attack Regiment
KUDRYAVTSEV, N. G.	8/18/45	Lieutenant, Flight Commander, 637th Ground Attack Regiment
KUDRYAVTSEV, S. S.	8/18/45	Senior Lieutenant, Flight Navigator, 373rd Bomber Regiment
KUDRYASHOV, K. M.	11/5/44	Major, Squadron Commander, 22nd Guards Air Regiment Long-Range Aviation
KUDRYASHOV, S. A.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 189th Guards Ground Attack Regiment
KUZENOV, I. P.	9/28/43	Junior Lieutenant, Flier, 66th Guards Fighter Regiment
KUZIN, A. G.	2/23/45	Major, Navigator, 90th Guards Ground Attack Regiment
KUZ'MICHEV, I. F.	6/27/45	Major, Deputy Commander for Political Affairs, 152nd Guards Fighter Regiment
KUZNETSOV, A. A.		General Major of Aviation

KUZNETSOV, A. I.	2/22/43	Captain, Navigator, 4th Guards Fighter Regiment	
KUZNETSOV, V. A.	8/18/45	Senior Lieutenant, Flight Commander, 6th Guards Ground Attack Regiment	
KUZNETSOV, V. I.		Colonel	
KUZNETSOV, V. M.	3/6/45	Major, Deputy Commander, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet	
KUZNETSOV, G. A.	3/6/45	Senior Lieutenant, Deputy Squadron Commander, 8th Guards Ground Attack Regiment	/540
KUZNETSOV, I. A.	6/27/45	Senior Lieutenant, Squadron Commander, 107th Guards Fighter Regiment	
KUZNETSOV, I. M.	5/15/46	Captain, Squadron Commander, 593rd Ground Attack Regiment	
KUZNETSOV, L. K.	2/23/45	Lieutenant, Squadron Commander, 806th Ground Attack Regiment	
KUZNETSOV, N. A.	10/26/44	Major, Deputy Commander for Aerial Gunnery Service, 760th Fighter Regiment	
KUZNETSOV, N. V.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 70th Guards Ground Attack Regiment	
KUZNETSOV, N. V.	6/29/45	Major, Deputy Commander, 58th Bomber Regiment	
KUZNETSOV, N. P.	6/27/45	Lieutenant, Flight Commander, 95th Guards Ground Attack Regiment	
KUZNETSOV, N. F.	5/1/43	Captain, Deputy Squadron Commander, 436th Fighter Regiment	
KUZNETSOV, P. N.	10/26/44	Major, Navigator, 155th Guards Ground Attack Regiment	
KUZNETSOV, S. A.	10/26/44	Major, Navigator, 233rd Fighter Regiment	
KUZ'MENKO, N. I.	6/29/45	Major, Deputy Commander for Flight Preparation, 140th Bomber Regiment	
KUZ'MIN, V. S.	6/29/45	Senior Lieutenant, Squadron Commander, 949th Ground Attack Regiment	

KUZ'MIN, G. P.	4/28/43	Captain, Squadron Commander, 239th Fighter Regiment
KULAGIN, A. M.	7/1/44	Senior Lieutenant, Deputy Squadron Commander, 249th Fighter Regiment
KULESHOV, V. K.	2/4/44	Senior Lieutenant, Navigator, 40th Guards Fighter Regiment
KULIYEV, A. G.	2/23/45	Captain, Deputy Squadron Commander, 65th Guards Fighter Regiment
KULIKOV, V. I.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 103rd Ground Attack Regiment
KULIKOV, V. N.	10/23/42	Captain, Squadron Commander, 18th Ground Attack Regiment Air Forces Black Sea Fleet
KULIKOV, N. A.	5/15/46	Senior Lieutenant, Squadron Commander, 187th Guards Ground Attack Regiment
KULIKOV, S. I.	12/31/42	Major, Flight Navigator, 2nd Guards Air Regiment Long-Range Aviation
KULICHEV, I. A.	10/26/44	Lieutenant, Flight Commander, 155th Guards Ground Attack Regiment
JUMANICHKIN, A. S.	4/13/44	Captain, Squadron Commander, 41st Guards Fighter Regiment
KUMSKOV, V. A.	5/15/46	Senior Lieutenant, Flight Commander, 90th Guards Ground Attack Regiment
KUNITSA, S. A.	2/10/42	Senior Political Officer, Squadron Military Commissar, 69th Fighter Regiment
KUPTSOV, S. A.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 154th Guards Ground Attack Regiment
KURAKIN, V. V.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 141st Guards Ground Attack Regiment
KURAKIN, N. S.	7/27/43	Captain, Detachment Commander, 3rd Air Regiment Long-Range Aviation
KURZENKOV, A. G.	1/22/44	Lieutenant, Flight Commander, 15th Independent Air Observation Squadron Air Forces Red Banner Baltic Fleet

KURZENKOV, S. G.	7/24/43	Captain, Deputy Commander, 78th Fighter Regiment
KURILOV, V. N.	8/18/45	Lieutenant, Flight Commander, 810th Ground Attack Regiment
KURMANIN, V. M.	8/18/45	Lieutenant, Flier, 43rd Guards Ground Attack Squadron /541
KUROYEDOV, N. I.	8/19/44	Senior Lieutenant, Flight Navigator, 10th Guards Air Regiment Long-Range Aviation
KUROCHKIN, V. M.	3/21/40	Lieutenant, Flight Commander, 7th Fighter Regiment
KURYUZHOV, D. K.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 810th Ground Attack Regiment
KURYATNIK, I. P.	12/31/42	Senior Lieutenant, Flight Commander, 751st Air Regiment Long-Range Aviation
KUSTOV, V. P.	8/29/39	Captain, Squadron Commander, 56th Fighter Regiment
KUSTOV, I. YE.	1/30/43	Senior Sergeant, Flier, 728th Fighter Regiment
KUTAKHOV, P. S.	5/1/43	Major, Squadron Commander, 19th Guards Fighter Regiment
KUFONIN, S. F.	2/23/45	Major, Navigator, 135th Ground Attack Regiment
KUKHAREV, I. M.	6/27/45	Major, Commander, 624th Ground Attack Regiment
KUTSEVALOV, T. F.	11/17/39	Colonel, Commander, 56th Fighter Regiment
KUCHERENKO, A. V.	6/29/45	Lieutenant, Flier, 525th Ground Attack Regiment
KUCHERYABA, T. A.	5/15/46	Captain, Squadron Commander, 43rd Guards Ground Attack Regiment
KUCHINSKIY, M. I.	2/23/45	Captain, Deputy Squadron Commander, 218th Ground Attack Regiment
KUCHUMOV, A. M.	5/15/46	Captain, Squadron Commander, 451st Ground Attack Regiment

LAVEYKIN, I. P.	8/24/43	Captain, Squadron Commander, 5th Guards Fighter Regiment
LAVITSKIY, N. YE.	8/24/43	Lieutenant, Flight Commander, 45th Fighter Regiment
LAVRENOV, A. F.	11/1/43	Lieutenant, Commander's Aide, 291st Fighter Regiment
LAVRONENKO, I. V.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 239th Fighter Regiment
LAGUTENKO, I. N.	8/18/45	Major, Deputy Commander, 68th Guards Fighter Regiment
LAZAREV, V. R.	5/15/46	Senior Lieutenant, Flight Commander, 173rd Guards Ground Attack Regiment
LAZAREV, I. A.	11/5/44	Captain, Deputy Squadron Commander, 13th Guards Air Regiment Long-Range Aviation
LAZAREV, S. I.	10/26/44	Lieutenant, Flight Commander, 728th Fighter Regiment
LAKOTOSH, V. P.	2/23/45	Junior Lieutenant, Flight Navigator, 392nd Night Bomber Regiment
LAKEYEV, I. A.	11/3/37	Lieutenant, Flier, 107th Squadron
LANDIK, I. I.	6/27/45	Captain, Squadron Commander, 482nd Fighter Regiment
LANOVENKO, M. T.	5/15/46	Major, Squadron Commander, 1st Guards Air Regiment Long-Range Aviation
LAPS, A. A.	3/13/44	Senior Lieutenant, Deputy Squadron Commander, 42nd Air Regiment Long-Range Aviation
LAPSHENKOV, S. V.	5/31/44	Major, Squadron Commander, 29th Fighter Regiment, Air Forces Northern Fleet
LARIONOV, G. P.	3/21/40	Senior Lieutenant, Flight Commander, 7th Fighter Regiment
LARIONOV, G. F.	11/5/44	Major, Navigator, 7th Guards Ground Attack Regiment Air Forces Red Banner Baltic Fleet
LATYPOV, K. K.	5/15/46	Lieutenant, Flight Commander, 187th Guards Ground Attack Regiment

LATYSHEV, V. A.	2/4/44	Senior Lieutenant, Deputy Squadron Commander, 67th Guards Fighter Regiment	
LAUKHIN, A. K.	9/2/43	Senior Lieutenant, Squadron Commander, 1st Guards Fighter Regiment	/542
LAKHONIN, V. I.	9/16/41	Lieutenant, Squadron Navigator, 22nd Air Regiment, Long-Range Aviation	
LAKHTIN, B. A.	8/19/44	Lieutenant, Flier, 62nd Guards Air Regiment	
LATSKOV,.N. S.	10/26/44	Senior Lieutenant, Squadron Commander, 431st Ground Attack Regiment	
LASHIN, G. I.	8/18/45	Lieutenant, Flier, 861st Bomber Regiment	
LASHIN, M. A.	6/29/45	Captain, Squadron Navigator, 135th Guards Bomber Regiment	
LEBEDEV, A. I.	5/15/46	Captain, Squadron Commander, 71st Guards Ground Attack Regiment	
LEBEDEV, A. T.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 43rd Guards Ground Attack Regiment	
LEBEDEV, G. S.	6/29/45	Senior Lieutenant, Flight Commander, 136th Guards Ground Attack Regiment	
LEBEDEV, D. I.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 173rd Guards Ground Attack Regiment	
LEBEDEV, D. M.	7/24/43	Captain, Flight Commander, 27th Independent Air Observation Squadron Air Forces Black Sea Fleet	
LEBEDEV, S. A.	2/23/45	Major, Squadron Commander, 43rd Fighter Regiment	
LEBEDEV, F. M.	6/27/45	Major, Squadron Commander, 482nd Fighter Regiment	
LEVANEVSKIY, S. A.	4/20/34	Pilot Northern Sea Route	
LEVIN, B. S.	10/26/44	Lieutenant, Flight Commander, 7th Guards Ground Attack Regiment	
LEVIN, G. T.	8/18/45	Captain, Squadron Commander, 565th Ground Attack Regiment	

LEBIN, M. V.	6/29/45	Senior Lieutenant, Deputy Squadron Commander, 1st Guards Air Regiment Long-Range Aviation
LEVITAN, V. S.	10/26/44	Captain, Squadron Commander, 88th Guards Fighter Regiment
LEVCHUK, S. L.	11/5/44	Senior Lieutenant, Flight Commander, 20th Guards Air Regiment Long-Range Aviation
LEZZHOV, I. I.	6/29/45	Lieutenant, Squadron Navigator, 98th Independent Long-Range Air Observation Regiment
LEONOV, A. A.		Lieutenant Colonel, Cosmonaut
LEONOV, I. D.	11/1/43	Captain, Squadron Commander, 85th Guards Fighter Regiment
LEONOV, I. M.	8/18/45	Lieutenant, Flier, 569th Ground Attack Regiment
LEONOV, N. I.	4/13/44	Senior Lieutenant, Squadron Commander, 183rd Fighter Regiment
LEONOVICH, I. S.	11/2/44	Senior Lieutenant, Deputy Squadron Commander, 29th Fighter Regiment
LEONT'YEV, V. A.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 24th Bomber Regiment
LEONCHENKO, N. K.	4/7/40	Captain, Flight Commander, 85th Air Regiment
LEPEKHIN, G. V.	12/31/42	Senior Lieutenant, Flight Commander, 751st Air Regiment
LETUCHIY, A. YA.	5/19/40	Senior Lieutenant, Deputy Squadron Commander, 3rd Light Bomber Regiment
LEFEVR, M.	6/4/45	Senior Lieutenant, Squadron Commander for the "Normandia-Neman" Regiment
LESHCHENKO, V. S.	8/24/43	Lieutenant, Deputy Squadron Commander, 4th Fighter Regiment
LIZUNOV, L. I.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 165th Guards Ground Attack Regiment
LIPILIN, A. A.	2/24/42	Senior Lieutenant, Flight Commander, 41st Fighter Regiment /542

LISITSIN, D. F.	9/28/43	Senior Lieutenant, Flier, 98th Guards Independent Air Observation Regiment
LISKONOZHENKO, N. G.	12/27/41	Lieutenant, Flight Commander, 513th Fighter Regiment
LITAVRIN, S. G.	1/28/43	Captain, Squadron Commander, 158th Fighter Regiment
LITVIN, I. T.	3/25/43	Captain, Crew Navigator, 749th Bomber Regiment Long-Range Aviation
LITVINENKO, T. A.	11/2/44	Major, Navigator, 191st Fighter Regiment
LITVINOV, F. P.	6/27/45	Major, Squadron Commander, 162nd Guards Bomber Regiment
LITVINOVA, L. N. (ROZONOVA)	2/23/48	Captain, Navigator, 46th Guards Night Bomber Regiment
LITVINCHUK, B. M.	5/16/44	Captain, Squadron Commander, 11th Guards Fighter Regiment Air Forces Black Sea Fleet
LIKHACHEV, V. K.	6/27/45	Lieutenant, Flight Commander, 106th Guards Fighter Regiment
LIKHOBABIN, I. D.	10/26/44	Major, Deputy Commander, 72nd Guards Fighter Regiment
LIKHOVID, M. S.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 104th Guards Fighter Regiment
LIKHOLETOV, P. YA.	2/4/44	Captain, Navigator, 159th Fighter Regiment
LABANOV, A. V.	9/28/43	Senior Lieutenant, Deputy Squadron Commander, 41st Guards Fighter Regiment
LOBANOV, YE. A.	1/22/44	Captain, Squadron Commander, 5th Guards Air Regiment Air Forces Black Sea Fleet
LOBANOV, YE. I.	6/14/42	Senior Lieutenant, Flier, 18th Air Regiment Air Forces Black Sea Fleet
LOBANOV, S. I.	5/24/43	Captain, Squadron Commander, 807th Ground Attack Regiment
LOBAS, P. K.	4/19/45	Captain, Commander, 86th Guards Fighter Regiment
LOBOV, G. A.		General Major of Aviation

LOBOZOV, V. A.	5/16/44	Major, Deputy Commander, 30th Air Observation Regiment Air Forces Black Sea Fleet
LOGVINENKO, A. P.	8/18/45	Junior Lieutenant, Flier, 951st Ground Attack Regiment
LOGVINENKO, N. P.	8/24/43	Captain, Squadron Commander, 293rd Fighter Regiment
LOGINOV, A. P.	2/23/45	Senior Lieutenant, Flight Commander, 91st Guards Ground Attack Regiment
LOZHECHNIKOV, A. A.	9/11/41	Major, Commander, 277th Ground Attack Regiment
LOZENKO, I. A.	4/13/44	Captain, Squadron Commander, 431st Ground Attack Regiment
LOZOVSKIY, V. A.	2/23/48	Captain, Deputy Squadron Commander, 897th Fighter Regiment
LOZORENKO, B. I.	5/15/46	Captain, Squadron Commander, 568th Ground Attack Regiment
LOKTIONOV, A. F.	11/20/41	Captain, Squadron Commander, 249th Fighter Regiment
LOMAKIN, A. G.	1/22/44	Senior Lieutenant, Deputy Squadron Commander, 21st Fighter Regiment Air Forces Red Banner Baltic Fleet
LOPATIN, B. V.	7/1/44	Captain, Squadron Commander, 667th Ground Attack Regiment
LOPATIN, F. I.	1/15/40	Junior Commander, Lead Plane Radio Operator, 6th Air Regiment
LORIN, M. V.	11/5/44	Captain, Squadron Navigator, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet /544
LOSKUTOV, V. G.	9/14/45	Lieutenant, Flier, 34th Air Regiment, AirForces Pacific Ocean Fleet
LOKHANOV, A. A.	8/24/43	Captain, Squadron Commander, 130th Bomber Regiment
LUGOVSKOY, O. I.	4/13/44	Senior Lieutenant, Deputy Squadron Commander, 502nd Ground Attack Regiment

LUZGIN, A. A.	5/15/46	Lieutenant, Flight Commander, 98th Guards Independent Long-Range Air Observation Regiment
LUKASHIN, V. I.	2/23/45	Senior Lieutenant, Squadron Commander, 175th Ground Attack Regiment
LUKIN, A. P.	10/26/44	Captain, Squadron Commander, 159th Guards Fighter Regiment
LUKIN, V. P.	10/26/44	Captain, Squadron Commander, 287th Fighter Regiment
LUK'YANETS, A. N.	6/27/45	Senior Lieutenant, Flight Navigator, 160th Guards Bomber Regiment
LUK'YANOV, A. M.	7/22/41	Junior Lieutenant, Flier, 159th Fighter Regiment
LUK'YANOV, A. G.	3/4/42	Senior Lieutenant, Squadron Commander, 487th Fighter Regiment Air Defense
LUK'YANOV, S. I.	4/13/44	Major, Squadron Commander, 16th Guards Fighter Regiment
LUK'YANTSEV, V. P.	2/4/44	Captain, Deputy Squadron Commander, 10th Independent Air Observation Regiment
LUNTS, B. G.	7/27/43	Captain, Squadron Commander, 101st Air Regiment Long-Range Aviation
LUN'KOV, N. A.	8/18/45	Lieutenant, Flight Commander, 62nd Ground Attack Regiment
LUSTO, M. V.	6/27/45	Senior Lieutenant, Squadron Commander, 129th Guards Fighter Regiment
LUTSENKO, V. D.	2/23/45	Lieutenant, Deputy Squadron Commander, 503rd Ground Attack Regiment
LUTSKIY, V. A.	8/24/43	Captain, Squadron Commander, 32nd Guards Fighter Regiment
LUSHCHENKO, G. A.	5/15/46	Captain, Squadron Navigator, 20th Guards Bomber Regiment
LYKOV, V. M.	7/1/44	Senior Lieutenant, Squadron Commander, 735th Ground Attack Regiment
LYSENKO, I. I.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 74th Guards Ground Attack Regiment

LYSENKO, N. K.	10/26/44	Major, Commander, 218th Ground Attack Regiment	
LYKHIN, S. YE.	7/1/44	Captain, Squadron Navigator, 742nd Independent Air Observation Regiment	
L'VOV, S. I.	7/24/43	Captain, Squadron Commander, 3rd Guards Fighter Regiment Air Forces Red Banner Baltic Fleet	
LYUBIMOV, I. S.	1/22/44	Lieutenant Colonel, Commander, 11th Guards Fighter Regiment Air Forces Black Sea Fleet	
LYULIN, S. M.	8/18/45	Captain, Squadron Navigator, 124th Guards Bomber Regiment	
LYUSIN, V. N.	8/19/44	Senior Lieutenant, Flight Commander, 85th Guards Fighter Regiment	
LYADOV, G. G.	10/26/44	Captain, Observation Pilot, 511th Independent Air Observation Regiment	
LYADSKIY, T. S.	2/23/45	Captain, Squadron Commander, 90th Guards Ground Attack Regiment	
LYALIN, V. K.	4/13/44	Captain, Squadron Navigator, 8th Independent Long-Range Air Observation Regiment	
LYAPIDEVSKIY, A. V.	4/20/34	Captain, Student at the N. Ye. Zhukovskiy Academy	/545
LYAKHOV, YA. YA.	2/23/45	Lieutenant, Flight Commander, 807th Ground Attack Regiment	
MAZAN, M. S.	5/15/46	Captain, Deputy Squadron Commander, 85th Guards Fighter Regiment	
MAZITOV, G. A.	8/19/44	Major, Navigator, 3rd Guards Air Regiment Long-Range Aviation	
MAZKOV, YE. K.	7/1/44	Senior Lieutenant, Flight Commander, 237th Ground Attack Regiment	
MAZURIN, F. M.	8/18/45	Captain, Deputy Squadron Commander, 28th Guards Fighter Regiment	
MAZURUK, I. P.	6/27/37	Colonel, Polar Aviator	
MAYKOV, N. I.	11/1/43	Lieutenant, Flight Commander, 134th Bomber Regiment	

MAYOROV, A. I.	9/2/43	Junior Lieutenant, Deputy Squadron Commander, 2nd Guards Fighter Regiment
MAYSKIY, D. V.	7/21/42	Senior Lieutenant, Flight Commander, 514th Dive Bomber Regiment
MAKAREVICH, S. A.	5/31/44	Captain, Deputy Squadron Commander, 9th Guards Mine Torpedo Air Regiment Air Forces Northern Fleet
MAKARENKO, A. I.	6/27/45	Senior Lieutenant, Flight Commander, 160th Guards Bomber Regiment
MAKARENKO, N. F.	2/10/43	Senior Lieutenant, Squadron Commander, 153rd Fighter Regiment
MAKAROV, A. T.	5/15/46	Senior Lieutenant, Flight Commander, 187th Guards Ground Attack Regiment
MAKAROV, A. S.	9/28/43	Senior Lieutenant, Flight Commander, 32nd Guards Fighter Regiment
MAKAROV, V. N.	1/28/43	Captain, Squadron Commander, 512th Fighter Regiment
MAKAROV, D. A.		Captain
MAKAROV, Z. I.	2/4/44	Captain, Squadron Commander, 91st Guards Ground Attack Regiment
MAKAROV, K. V.	2/23/45	Senior Lieutenant, Flight Commander, 74th Guards Ground Attack Regiment
MAKAROV, M. A.	8/18/45	Lieutenant, Flight Commander, 828th Ground Attack Regiment
MAKAROV, N. G.	6/29/45	Major, Squadron Commander, 826th Ground Attack Regiment
MAKAROV, P. G.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 525th Air Regiment
MAKAROV, S. V.	5/5/42	Lieutenant, Flight Commander, 180th Fighter Regiment
MAKAROVA, T. P.	2/23/45	Lieutenant, Flight Commander, 46th Guards Night Bomber Regiment
MAKEROV, L. N.	4/19/45	Captain, Deputy Commander for Aerial Gunnery Service, 943rd Ground Attack Regiment

MAKOVSKIY, S. I.	4/13/44	Senior Lieutenant, Squadron Commander, 43rd Fighter Regiment
MAKSIMENKO, V. I.	11/23/42	Senior Lieutenant, Squadron Commander, 88th Fighter Regiment
MAKSIMOV, A. YE.	4/10/45	Major, Squadron Commander, 156th Guards Fighter Regiment
MAKSIMOV, N. V.	6/27/45	Captain, Navigator, 624th Ground Attack Regiment
MAKSIMCHA, I. V.	8/18/45	Captain, Squadron Commander, 810th Ground Attack Regiment
MALANOV, A. A.	2/10/42	Senior Lieutenant, Flight Commander, 69th Fighter Regiment
MALAKHOV, N. M.	6/29/45	Captain, Deputy Squadron Commander, 76th Guards Ground Attack Regiment
MALASHENKOV, G. S.	5/15/46	Captain, Squadron Navigator, 745th Bomber Regiment
MALEN, A. A.	2/23/45	Captain, Squadron Commander, 74th Guards Ground Attack Regiment
MALIKOV, I. A.	5/15/46	Senior Lieutenant, Flight Commander, 128th Bomber Regiment
MALIN, A. P.	6/29/45	Squadron Navigator, 140th Bomber Regiment
MALIN, K. YA.	5/15/46	Junior Lieutenant, Flier, 175th Guards Ground Attack Regiment
MALOV, M. S.	9/28/43	Captain, Squadron Commander, 800th Ground Attack Regiment
MALOV, O. I.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 79th Guards Ground Attack Regiment
MALUSHCHENKO, M. YE.	6/29/45	Captain, Squadron Navigator, 134th Guards Bomber Regiment
MALYGIN, V. I.	9/16/41	Major, Navigator, 40th Long Range Bomber Division
MAL'TSEV, I. A.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 7th Guards Ground Attack Regiment

MAL'TSEV, K. S.	5/15/46	Captain, Squadron Commander, 177th Guards Fighter Regiment
MAL'CHENKO, M. P.	6/29/45	Lieutenant, Flier, 136th Guards Ground Attack Regiment
MAMAY, N. V.	6/27/45	Captain, Navigator, 82nd Guards Bomber Regiment
MANKEVICH, V. M.	8/18/45	Major, Navigator, 163rd Fighter Regiment
MANOYLOV, I. A.	3/31/43	Senior Lieutenant, Deputy Squadron Commander, 774th Fighter Regiment
MANOKHIN, A. N.	8/19/44	Captain, Squadron Commander, 15th Guards Ground Attack Regiment
MANOSHIN, K. V.	10/26/44	Major, Navigator, 64th Guards Fighter Regiment
MANUKYAN, A. B.	5/15/46	Captain, Deputy Commander for Aerial Gunnery Service, 402nd Fighter Regiment
MARES'YEV, A. P.	8/24/43	Senior Lieutenant, Deputy Squadron Commander, 63rd Guards Fighter Regiment
MARIINSKIY, YE. P.	6/27/45	Lieutenant, Flight Commander, 129th Guards Fighter Regiment
MARKELOV, N. D.	2/23/45	Lieutenant, Flight Commander, 806th Ground Attack Regiment
MARKIN, A. M.	5/31/44	Sergeant, Aerial Gunner, 46th Ground Attack Regiment
MARKIN, V. V.	6/27/45	Senior Lieutenant, Squadron Commander, 624th Ground Attack Regiment
MARKIN, N. V.	11/1/43	Senior Lieutenant, Deputy Squadron Commander, 274th Fighter Regiment
MARKIN, S. S.	11/5/44	Captain, Flight Commander, 5th Guards Air Regiment Long-Range Aviation
MARKOV, A. M.	4/7/40	Junior Lieutenant, Flier, 42nd Air Regiment, Long-Range Aviation
MARKOV, A. I.	2/23/45	Senior Lieutenant, Flight Commander, 32nd Guards Fighter Regiment

MARKOV, V. V.	2/4/44	Senior Lieutenant, Deputy Commander for Aerial Gunnery Service, 116th Fighter Regiment
MARKOVTSEV, S. KH.	6/29/45	Lieutenant Colonel, Commander, 208th Ground Attack Regiment
MARKUTSA, P. A.	7/22/41	Senior Lieutenant, Flight Commander, 44th High Speed Bomber Regiment
MARTYNENKO, V. F.		
MARTYNENKO, I. N.	3/24/45	Major, Deputy Commander, 187th Independent Aerial Spotting Reconnaissance Regiment
MARTYNOV, A. V.	8/12/42	Senior Lieutenant, Deputy Squadron Commander, 296th Fighter Regiment
MARTYNOV, A. P.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 45th Guards Bomber Regiment /547
MARTYNOV, YE. V.	8/18/45	Lieutenant, Flight Commander, 98th Independent Long-Range Air Observation Regiment
MARTYNOV, M. I.	3/21/40	Captain, Squadron Commander, 48th High Speed Bomber Regiment
MART'YANOV, N. I.	4/19/45	Captain, Deputy Squadron Commander, 76th Guards Ground Attack Regiment
MARYSICHENKO, K. I.	3/13/44	Major, Aircraft Commander, 890th Air Regiment Long-Range Aviation
MARCHENKO, A. YA.	3/13/44	Captain, Deputy Squadron Commander, 24th Guards Air Regiment Long-Range Aviation
MARCHENKO, I. T.	11/5/44	Captain, Deputy Squadron Commander, 30th Independent Air Observation Regiment Air Forces Black Sea Fleet
MAR'IN, I. I.	5/15/46	Senior Lieutenant, Flight Navigator, 24th Guards Bomber Regiment
MARYUTIN, P. M.	7/21/42	Senior Lieutenant, Deputy Squadron Commander, 288th Ground Attack Regiment
MARCHENKOV, M. N.	2/22/39	Junior Commander, Radio Gunner, 18th Squadron

MASICH, V. G.	4/7/40	Junior Lieutenant, Squadron Navigator, 68th Fighter Regiment
MASLENNIKOV, V. I.	3/13/44	Major, Squadron Commander, 101th Air Regiment, Long-Range Aviation
MASLOV, A. P.	4/19/45	Junior Lieutenant, Flier, 74th Guards Ground Attack Regiment
MASLOV, V. A.	6/29/45	Major, Deputy Commander, 9th Guards Air Regiment
MASLOV, I. V.	7/1/44	Senior Lieutenant, Deputy Squadron Commander, 157th Fighter Regiment
MASNEV, A. N.	8/24/43	Captain, Squadron Commander, 13th Fighter Regiment
MASTERKOV, A. B.	6/27/45	Senior Lieutenant, Flight Commander, 5th Guards Fighter Regiment
MATAKOV, V. N.	3/4/42	Junior Lieutenant, Deputy Squadron Commander, 27th Fighter Regiment Air Defense
MATVEYEV, A. V.	2/4/44	Lieutenant, Squadron Commander, 241st Ground Attack Regiment
MATVEYEV, V. I.	7/22/41	Captain, Squadron Commander, 154th Fighter Regiment
MATVEYEV, I. F.	8/18/42	Senior Lieutenant, Detachment Commander, 250th Air Regiment, Long-Range Aviation
MATVEYEV, M. A.	8/19/44	Captain, Squadron Commander, 7th Guards Ground Attack Regiment
MATVEYEV, P. YA.	3/13/44	Captain, Detachment Commander, 11th Guards Air Regiment Long-Range Aviation
MATVEYEV, YA. I.	9/14/45	Captain, Deputy Commander, 35th Ground Attack Regiment Air Forces Pacific Ocean Fleet
MATIENKO, P. A.	2/4/44	Major, Navigator, 270th Fighter Regiment
MATIKOV, A. P.	7/1/44	Lieutenant Colonel, Commander, 673rd Ground Attack Regiment
MATROSOV, A. YE.	3/25/43	Major, Squadron Commander, 4th Air Regiment Long-Range Aviation

MATRUNCHUK, I. V.	5/20/40	Captain, Squadron Commander, 18th High Speed Bomber Regiment
MAKHALIN, V. N.		Lieutenant Colonel
MAKHRINOV, G. F.	5/15/46	Captain, Flight Commander, 72nd Independent Air Observation Regiment
MATSIEVICH, V. A.	2/14/43	Captain, Squadron Commander, 26th Fighter Regiment Air Defense
MACHIN, M. G.	5/29/45	General Major of Aviation, Commander, 5th Fighter Corps
MACHNEV, A. G.	8/24/43	Senior Lieutenant, Squadron Commander, 566th Ground Attack Regiment /548
MASHANIN, G. M.	6/29/45	Lieutenant, Flight Commander, 6th Independent Guards Ground Attack Regiment
MASHKOVSKIY, S. F.	9/11/41	Senior Lieutenant, Squadron Commander, 184th Fighter Regiment
MEBAGISHVILI, K. A.	6/29/45	Lieutenant, Flight Commander, 74th Guards Ground Attack Regiment
MEDVEDEV, A. N.	8/18/45	Major, Navigator, 122nd Guards Bomber Regiment
MEDVEDEV, V. A.	5/15/46	Senior Lieutenant, Flight Commander, 79th Guards Ground Attack Regiment
MEDVEDEV, D. A.	5/15/46	Lieutenant Colonel, Commander, 486th Fighter Regiment
MEDNONOGOV, V. A.	8/18/45	Junior Lieutenant, Flier, 783rd Ground Attack Regiment
MEYLUS, I. I.	2/23/45	Captain, Navigator, 958th Ground Attack Regiment
MEKLIN (KRAVTSOVA)N. F.	2/23/45	Lieutenant, Flier, 46th Guards Night Bomber Regiment
MELAKH, YE. L.	2/4/44	Captain, Flight Commander, 47th Guards Long-Range Air Observation Regiment
MELESHKO, O. I.	5/15/46	Captain, Flight Commander, 20th Guards Bomber Regiment

MEL'NIKOV, B. V.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 143rd Guards Ground Attack Regiment
MEL'NIKOV, I. S.	6/29/45	Captain, Crew Navigator, 98th Guards Independent Air Observation Regiment
MEL'NIKOV, N. K.	7/1/44	Lieutenant, Flight Commander, 210th Ground Attack Regiment
MEL'NIKOV, V. YE.		Major
MENSHUTIN, YE. P.	6/27/45	Lieutenant, Flight Commander, 152nd Guards Fighter Regiment
MERENKOV, V. A.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 897th Fighter Regiment
MERKVILADZE, G. A.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 152nd Guards Fighter Regiment
MERKULOV, V. I.	10/26/44	Lieutenant, Flight Commander, 43rd Fighter Regiment
MERKUSHEV, V. A.	9/2/43	Major, Commander, 270th Fighter Regiment
MESHCHERYAKOV, I. I.	5/5/42	Captain, Squadron Commander, 5th Guards Fighter Regiment
MIGUNOV, V. V.	10/22/41	Lieutenant, Flier, 29th Fighter Regiment
MIZINOV, M. P.	8/24/43	Senior Lieutenant, Flight Commander, 128th Dive Bomber Regiment
MIKRYUKOV, V. V.	6/29/45	Captain, Deputy Squadron Commander, 897th Fighter Regiment
MILASHENKOV, S. V.	6/27/45	Senior Lieutenant, Squadron Commander, 109th Guards Ground Attack Regiment
MILEN'KIY, I. A.	6/29/45	Master Sergeant, Aerial Gunner, 566th Ground Attack Regiment
MILETSKIY, V. M.	8/18/45	Captain, Squadron Navigator, 373rd Bomber Regiment
MILOVANOV, A. M.	7/1/44	Captain, Squadron Commander, 193rd Fighter Regiment
MILYUKOV, V. A.	5/15/46	Senior Lieutenant, Flight Commander, 59th Guards Ground Attack Regiment

MINAKOV, V. I.	11/5/44	Senior Lieutenant, Flight Commander, 5th Guards Mine Torpedo Air Regiment Air Forces Black Sea Fleet
MINEYEV, D. M.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 175th Ground Attack Regiment
MINENKO, L. I.		
MININ, YA. K.	2/4/44	Junior Lieutenant, Flier, 667th Ground Attack Regiment
MINKEVICH, F. A.	3/29/42	Major, Navigator, 750th Air Regiment Long-Range Aviation /549
MINNIBAYEV, G. KH.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 947th Ground Attack Regiment
MINCHUGOV, D. M.	7/24/43	Major, Squadron Commander, 5th Guards Air Regiment Air Forces Black Sea Fleet
MIOKOV, N. D.	6/27/45	Major, Squadron Commander, 91st Fighter Regiment
MIROVICH, A. I.	6/29/45	Captain, Deputy Squadron Commander, 98th Guards Independent Long-Range Air Observation Regiment
MIRONENKO, A. A.	7/22/44	Major, Commander, 13th Fighter Regiment, Air Forces Red Banner Baltic Fleet
MIRONENKO, A. N.	8/18/45	Senior Lieutenant, Flight Commander, 118th Guards Ground Attack Regiment
MIRONOV, A. I.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 826th Ground Attack Regiment
MIRONOV, A. N.	8/18/45	Captain, Deputy Squadron Commander, 250th Guards Bomber Regiment
MIRONOV, V. P.	6/6/42	Senior Lieutenant, Flight Commander, 145th Fighter Regiment
MIRONOV, S. I.	4/7/40	Senior Lieutenant, Flight Commander, 68th Fighter Regiment
MIROSHNICHENKO, D. G.	10/26/44	Senior Lieutenant, Squadron Commander, 248th Fighter Regiment
MIROSHNICHENKO, N. P.	6/29/45	Senior Lieutenant, Squadron Commander, 34th Guards Bomber Regiment

MITROFANOV, F. V.	2/14/43	Senior Lieutenant, Squadron Commander, 445th Fighter Regiment Air Defense
MITROKHIN, V. B.	11/2/44	Captain, Squadron Commander, 191st Fighter Regiment
MITROSHIN, V. T.	3/13/44	Captain, Squadron Commander, 9th Air Regiment Long-Range Aviation
MIKHAYLENKO, YE. YE.	10/26/44	Senior Lieutenant, Squadron Commander, 92nd Guards Ground Attack Regiment
MIKHAYLIK, YA. D.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 54th Guards Fighter Regiment
MIKHAYLOV, V. M.	2/4/44	Captain, Squadron Commander, 672nd Ground Attack Regiment
MIKHAYLOV, V. N.	2/10/43	Major, Navigator, 125th Bomber Regiment
MIKHAYLOV, V. A.	5/15/46	Senior Lieutenant, Flight Commander, 163rd Guards Fighter Regiment
MIKHAYLOV, YE. V.	10/26/44	Lieutenant, Flier, 32nd Guards Fighter Regiment
MIKHAYLOV, L. V.	7/22/41	Captain, Squadron Commander, 10th High Speed Bomber Regiment
MIKHAYLOV, P. M.	6/29/45	Lieutenant, Aircraft Commander for the Special Transport Squadron
MIKHALEV, V. P.	7/1/44	Senior Lieutenant, Squadron Commander, 508th Fighter Regiment
MIKHALEV, V. A.	8/13/41	Lieutenant, Flight Commander, 71st Fighter Regiment Air Forces Red Banner Baltic Fleet
MIKHALENKO, K. F.	5/15/46	Senior Lieutenant, Flight Commander, 45th Guards Bomber Regiment
MIKHALENKOV, YE. A.	4/13/44	Captain, Squadron Commander, 78th Guards Ground Attack Regiment
MIKHEYEV, G. YA.	5/24/43	Captain, Flight Navigator, 10th Independent Long-Range Air Observation Regiment
MIKHIN, M. I.		Captain

MISHANOV, N. D.	5/15/46	Captain, Deputy Squadron Commander, 96th Guards Bomber Regiment	
MISHIN, A. V.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 657th Ground Attack Regiment	/550
MISHUSTIN, V. I.	6/27/45	Major, Squadron Commander, 88th Guards Fighter Regiment	
MKRTUMOV, S. M.	12/13/42	Captain, Deputy Squadron Commander for Political Affairs, 805th Ground Attack Regiment	
MOGIL'CHAK, I. L.	2/4/44	Senior Lieutenant, Squadron Commander, 235th Ground Attack Regiment	
MOZHEYKO, P. V.	6/29/45	Major, Squadron Commander, 525th Ground Attack Regiment	
MOISEYEV, O. V.	5/15/46	Senior Lieutenant, Flight Commander, 175th Guards Ground Attack Regiment	
MOISEYENKO, A. S.	2/23/45	Lieutenant, Flight Commander, 62nd Ground Attack Regiment	
MOLEV, A. O.	10/25/44	Senior Lieutenant, Squadron Commander, 33rd Guards Ground Attack Regiment	
MOLODCHIKOV, V. N.	2/23/45	Captain, Deputy Commander for Aerial Gunnery Service, 91st Guards Ground Attack Regiment	
MOLODCHININ, A. YE.	8/24/43	Captain, Squadron Commander, 1st Guards Fighter Regiment	
MOLOZEV, V. F.	6/29/45	Junior Lieutenant, Flier, 75th Guards Ground Attack Regiment	
MOLOKOV, V. S.	4/20/34	Detachment Commander for Polar Aviation	
MOLCHANOV, A. M.	8/18/45	Junior Lieutenant, Flier, 569th Ground Attack Regiment	
MORGUNOV, S. N.	5/15/46	Lieutenant, Squadron Commander, 15th Fighter Regiment	
MORGUNOV, YU. V.	2/4/44	Junior Lieutenant, Flier, 48th Guards Long-Range Air Observation Regiment	
MORDIN, V. A.	7/24/43	Captain, Flier, 40th Air Regiment, Air Forces Black Sea Fleet	

MOROZOV, A. A.	3/27/42	Senior Lieutenant, Flight Commander, 4th Fighter Regiment
MOROZOV, A. I.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 149th Fighter Regiment
MOROZOV, V. P.	8/19/44	Major, Squadron Commander, 20th Air Regiment Long-Range Aviation
MOROZOV, I. V.	8/18/45	Senior Lieutenant, Squadron Commander, 569th Ground Attack Regiment
MOROZOV, I. I.	6/27/45	Captain, Squadron Commander, 110th Guards Ground Attack Regiment
MOROZOV, N. N.	3/4/42	Senior Lieutenant, Squadron Commander, 731st Fighter Regiment Air Defense
MOROZOV, S. I.	11/1/43	Junior Lieutenant, Flier, 807th Ground Attack Regiment
MOROZOV, F. YA.	9/28/43	Senior Lieutenant, Deputy Squadron Commander, 31st Guards Fighter Regiment
MOROZ, I. M.	5/7/65	Senior Political Officer, Military Commissar, 92nd Fighter Regiment
MOSIENKO, S. I.	8/18/45	Senior Lieutenant, Flier, 11th Independent Air Observation Regiment
MOSKALENKO, G. V.	6/14/42	Senior Lieutenant, Flight Commander, 6th Guards Air Regiment Air Forces Black Sea Fleet
MOSKALENKO, I. YE.	2/4/44	Captain, Squadron Commander, 946th Ground Attack Regiment
MOSKVICHEV, V. A.	5/15/46	Lieutenant, Flier, 825th Ground Attack Regiment
MOSKOVENKO, V. I.	5/27/45	Senior Lieutenant, Flight Commander, 1st Guards Fighter Regiment
MOSOLOV, A. I.	9/18/43	Major, Deputy Commander, 3rd Air Regiment Long-Range Aviation
MOSOLOV, G. K.		Captain
MOSTOVOY, N. A.	6/29/45	Captain, Squadron Commander, 22nd Guards Bomber Regiment

MOS'PANOV, I. P.	11/23/42	Senior Lieutenant, Squadron Commander, 7th Guards Ground Attack Regiment	/551
MOTKOV, P. I.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 826th Ground Attack Regiment	
MOTORIN, N. YA.	6/29/45	Lieutenant, Flier, 565th Ground Attack Regiment	
MOTORNYY, I. P.	1/28/43	Captain, Commander, 512th Ground Attack Regiment	
MOTUZ, I. F.	8/24/43	Captain, Squadron Commander, 744th Fighter Regiment	
MOCHALOV, V. N.	2/23/45	Captain, Squadron Commander, 78th Guards Ground Attack Regiment	
MOCHALOV, M. I.	10/26/44	Lieutenant, Deputy Squadron Commander, 144th Guards Ground Attack Regiment	
MOSHIN, A. F.	8/29/39	Lieutenant, Flier, 56th Fighter Regiment	
MOSHKOV, B. N.	8/19/44	Senior Lieutenant, Deputy Squadron Commander, 431st Ground Attack Regiment	
MUDRETSOV, V. F.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 178th Guards Fighter Regiment	
MUZHAYLO, N. T.	5/15/46	Lieutenant, Chief of Squadron Communications, 8th Guards Bomber Regiment	
MURAVITSKIY, L. Z.	10/22/41	Senior Lieutenant, Flier, 24th Fighter Regiment	
MURAV'YEV, P. I.	5/1/43	Senior Lieutenant, Squadron Commander, 271st Fighter Regiment	
MURASHEV, A. A.	9/28/43	Captain, Squadron Commander, 3rd Guards Fighter Regiment	
MURASHKIN, YA. A.	2/23/45	Captain, Squadron Commander, 111th Guards Fighter Regiment	
MUSATOV, I. I.	8/19/44	Lieutenant, Flier, 10th Guards Air Regiment Long-Range Aviation	
MUSATOV, N. A.	5/15/46	Lieutenant Colonel, Commander, 13th Guards Air Regiment Air Forces Black Sea Fleet	

MUSIENKO, I. A.	8/18/45	Major, Commander, 6th Independent Ground Attack Regiment
MUSINSKIY, N. S.	1/30/43	Lieutenant, Flier, 128th Short-Range Bomber Regiment
MUSTAFIN, M. A.	10/26/44	Senior Lieutenant, Flight Commander, 163rd Guards Ground Attack Regiment
MUKHIN, A. F.	5/15/46	Senior Lieutenant, Flight Commander, 177th Guards Fighter Regiment
MUKHIN, V. F.	2/23/45	Lieutenant, Flight Commander, 178th Guards Fighter Regiment
MUSHNIKOV, G. I.	4/10/45	Senior Lieutenant, Flight Commander, 140th Guards Ground Attack Regiment
MYSNICHENKO, V. I.	6/29/45	Captain, Squadron Navigator, 96th Independent Aerial Spotting Reconnaissance Regiment
MYASNIKOV, YE. A.	8/18/45	Senior Lieutenant, Squadron Commander, 449th Bomber Regiment
NAVROTSKIY, M. A.	3/27/42	Lieutenant, Crew Navigator, 132nd High Speed Bomber Regiment
NAVROTSKIY, M. K.	11/5/44	Senior Lieutenant, Squadron Navigator, 12th Guards Air Regiment Long-Range Aviation
NAGORNYY, V. S.	7/1/44	Senior Lieutenant, Flight Commander, 293rd Fighter Regiment
NAGUL'YAN, M. K.	8/18/45	Lieutenant, Flight Commander, 593rd Ground Attack Regiment
NADEZHDIN, P. F.	8/19/44	Lieutenant, Flight Commander, 807th Ground Attack Regiment
NADTACHEYEV, G. M.	4/13/44	Junior Lieutenant, Flier, 76th Guards Ground Attack Regiment
NAZARENKO, D. P.	12/13/42	Captain, Squadron Commander, 131st Fighter Regiment
NAZAROV, A. T.	8/19/44	Lieutenant Colonel, Deputy Commander, 18th Guards Air Regiment Long-Range Aviation
NAZIMOV, K. S.	10/26/44	Captain, Squadron Commander, 254th Fighter Regiment /552

NAZIN, I. I.	5/1/43	Junior Lieutenant, Flight Commander, 6th Bomber Regiment
NAYDENKO, V. M.	4/21/43	Major, Commander, 126th Fighter Regiment, Air Defense
NAYDENOV, N. A.	8/24/43	Senior Lieutenant, Squadron Commander, 563rd Fighter Regiment
NAKONECHNIKOV, A. G.	7/1/44	Lieutenant Colonel, Commander, 78th Guards Ground Attack Regiment
NANEYSHVILI, V. V.	3/21/40	Colonel, Commander, 18th Air Brigade
NARZHIMSKIY, V. A.	3/6/45	Captain, Deputy Squadron Commander, 11th Guards Fighter Regiment Air Forces Black Sea Fleet
NAUMENKO, I. A.	2/4/44	Senior Lieutenant, Deputy Squadron Commander, 58th Guards Ground Attack Regiment
NAUMENKO, S. I.		Major
NAUMOV, V. N.	4/13/44	Senior Lieutenant, Squadron Navigator, 367th Bomber Regiment
NAUMOV, N. A.	6/14/42	Lieutenant Colonel, Pilot Technique Inspector, Air Forces Black Sea Fleet
NAUMOV, P. I.	8/21/43	Major, Pilot, Pilot Technique Inspector, 201st Ground Attack Division
NAUMCHIK, N. K.	5/1/43	Captain, Squadron Commander, 42nd Guards Fighter Regiment
NEVKIPELYY, G. T.	2/24/42	Lieutenant, Squadron Commander, 65th Ground Attack Regiment
NEKRASOV, V. P.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 483rd Fighter Regiment
NEMENKO, S. A.	8/18/45	Major, Deputy Commander, 825th Ground Attack Regiment
NEMKOV, I. A.	7/24/43	Senior Lieutenant, Flight Commander, 26th Independent Air Observation Squadron Air Forces Red Banner Baltic Fleet
NEMTINOV, A. A.	7/1/44	Lieutenant, Deputy Commander for Aerial Gunnery Service 79th Ground Attack Regiment

NEPOCHELOVICH, I. B.	6/29/45	Junior Lieutenant, Flier, 995th Ground Attack Regiment
NEPRYAKHIN, P. M.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 2nd Guards Fighter Regiment
NESMASHNOY, G. I.	12/31/42	Captain, Flight Commander, 2nd Air Regiment Long-Range Aviation
NESTERENKO, G. K.	11/1/43	Lieutenant, Flier, 291st Fighter Regiment
NESTERENKO, D. A.	2/4/44	Captain, Squadron Commander, 820th Ground Attack Regiment
NESTEROV, I. K.	11/1/43	Junior Lieutenant, Flight Commander, 31st Guards Fighter Regiment
NEUSTRUEV, I. P.	9/28/43	Major, Commander, 11th Fighter Regiment
NEFEDOV, A. I.	4/21/40	Major, Chief of Headquarters, 27th Fighter Regiment Air Forces Northern Fleet
NEFEDOV, V. A.		Major
NECHAYEV, V. G.	4/7/40	Junior Commander, Lead Plane Radio Gunner, 54th High Speed Bomber Regiment
NECHAYEV, V. F.	2/23/45	Captain, Squadron Commander, 6th Independent Guards Ground Attack Regiment
NECHIPURENKO, I. I.	5/15/46	Lieutenant, Flight Commander, 173rd Guards Ground Attack Regiment
NIKITENKO, N. M.	2/23/45	Junior Lieutenant, Flight Commander, 958th Ground Attack Regiment
NIKITIN, A. I.	2/10/43	Lieutenant, Flight Commander, 153rd Fighter Regiment
NIKITIN, A. P.	5/15/46	Major, Deputy Commander, 338th Bomber Regiment
NIKITIN, M. YE.	5/15/46	Senior Lieutenant, Squadron Commander, 131st Guards Ground Attack Regiment
NIKITIN, N. A.	3/6/45	Senior Lieutenant, Flight Commander, 35th Ground Attack Regiment Air Forces Red Banner Baltic Fleet /553

NIKIFOROV, K. S.	6/29/45	Senior Lieutenant, Deputy Commander for Aerial Gunnery Service, 208th Ground Attack Regiment
NIKIFOROV, P. P.	6/27/45	Captain, Navigator, 129th Guards Fighter Regiment
NIKISHIN, M. D.	2/23/45	Senior Lieutenant, Squadron Commander, 448th Ground Attack Regiment
NIKOLAYEV, A. F.		Lieutenant Colonel
NILOLAYEV, A. G.		Major, Cosmonaut
NIKOLAYEV, A. M.	9/14/45	Major, Commander, 26th Ground Attack Regiment Pacific Ocean Fleet
NIKOLAYEV, V. N.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 62nd Ground Attack Regiment
NIKOLAYEV, G. G.	6/6/42	Junior Lieutenant, Flight Commander, 288th Bomber Regiment
NIKOLAYEV, D. S.	9/8/43	Senior Lieutenant, Flight Commander, 27th Guards Fighter Regiment
NIKOLAYEV, I. A.	6/29/45	Lieutenant, Flight Commander, 74th Guards Ground Attack Regiment
NIKOLAYEV, I. S.	5/15/46	Major, Squadron Commander, 90th Guards Ground Attack Regiment
NIKOLAYEV, N. I.	5/16/44	Senior Lieutenant, Squadron Commander, 8th Guards Ground Attack Regiment
NIKOLAYENKO, V. M.	4/13/44	Junior Lieutenant, Flier, 98th Guards Independent Long-Range Air Observation Regiment
NIKOLAYENKO, YE. M.	2/22/39	Major, Squadron Commander
NIKOLAYENKO, N. M.	10/26/44	Senior Lieutenant, Chief of Squadron Communications, 50th Air Observation Regiment
NIKOLAYENKO, A. I.	8/24/43	Senior Lieutenant, Deputy Squadron Commander, 760th Fighter Regiment
NIKONOROV, P. M.	7/1/44	Lieutenant, Flight Commander, 88th Guards Fighter Regiment

NIKULIN, D. YE.	8/19/44	Senior Lieutenant, Chief of Squadron Communications, 99th Independent Air Observation Regiment
NIKULINA, YE. A.	10/26/44	Major, Squadron Commander, 46th Guards Night Bomber Regiment
NOVIKOV, A. A.	6/27/45	Lieutenant Colonel, Commander, 162nd Guards Bomber Regiment
NOVIKOV, A. YE.	1/30/43	Master Sergeant, Pilot, 728th Fighter Regiment
NOVIKOV, A. K.	6/27/45	Captain, Squadron Commander, 108th Guards Ground Attack Regiment
NOVIKOV, A. I.	2/4/43	Captain, Squadron Commander, 176th Fighter Regiment
NOVIKOV, B. A.	8/18/45	Captain, Squadron Commander, 214th Ground Attack Regiment
NOVIKOV, G. I.	6/27/45	Captain, Squadron Commander, 82nd Guards Bomber Regiment
NOVIKOV, YE. P.	1/16/42	Junior Lieutenant, Flight Commander, 191st Fighter Regiment
NOVIKOV, K. A.	5/1/43	Junior Lieutenant, Flier, 40th Guards Fighter Regiment
NOVIKOV, P. S.	4/19/45	Senior Lieutenant, Squadron Commander, 943rd Ground Attack Regiment
NOVITSKIY, YE. G.	3/6/45	Captain, Chief of the Parachute Forces, 7th Guards Ground Attack Regiment Air Forces Red Banner Baltic Fleet
NOVICHKOV, S. M.	2/4/44	Senior Lieutenant, Flight Commander, 67th Guards Fighter Regiment
NOVOZHILOV, I. V.	8/24/43	Captain, Deputy Commander for Aerial Gunnery Service, 13th Fighter Regiment
NOVOZHILOV, N. V.	8/19/44	Captain, Squadron Commander, 108th Air Regiment /554
NOVOSELOV, K. V.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 115th Guards Fighter Regiment

NOGA, M. P.	11/17/39	Senior Lieutenant, Squadron Commander, 7th Fighter Regiment
NOSAL', YE. I.	5/24/43	Junior Lieutenant, Deputy Squadron Commander, 46th Guards Night Bomber Regiment
NOSKOV, N. I.	6/27/45	Captain, Squadron Commander, 142nd Guards Ground Attack Regiment
NOSOV, A. A.	7/21/42	Lieutenant, Flight Commander, 288th Ground Attack Regiment
NOSOV, S. V.	5/15/46	Lieutenant, Flight Commander, 150th Guards Fighter Regiment
NOSOVETS, A. YE.	11/5/44	Major, Deputy Navigator, 14th Guards Air Regiment Long-Range Aviation
NURPISOV, P. K.	8/18/45	Senior Lieutenant, Observation Pilot, 47th Guards Independent Air Observation Regiment
NYUKHTIKOV, M. A.		
OBELOV, L. V.	4/19/45	Senior Lieutenant, Squadron Commander, 566th Ground Attack Regiment
OBORIN, A. V.	4/10/45	Lieutenant Colonel, Commander, 438th Fighter Regiment
OBRAZTSOV, B. A.		Senior Lieutenant
OBUKHOV, V. M.	3/13/44	Major, Deputy Squadron Commander, 25th Guards Air Regiment Long-Range Aviation
OBUKHOV, T. P.	5/1/43	Major, Navigator, 12th Fighter Regiment
OVODOV, YA. L.	5/15/46	Major, Deputy Commander for Aerial Gunnery Service, 133rd Fighter Regiment
OVSYANIKOV, D. N.	4/19/45	Lieutenant, Flight Commander, 74th Guards Ground Attack Regiment
OVCHINNIKOV, A. P.	6/27/45	Senior Lieutenant, Navigator, 143rd Guards Ground Attack Regiment
OGANESOV, V. M.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 347th Fighter Regiment
OGAREV, M. S.	8/18/45	Junior Lieutenant, Flier, 783rd Ground Attack Regiment

OGLOBLIN, I. V.	4/13/44	Senior Lieutenant, Flight Commander, 25th Guards Night Bomber Regiment
ODNOBOKOV, P. M.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 118th Guards Ground Attack Regiment
ADNOVORCHENKO, S. S.	2/23/45	Major, Squadron Commander, 448th Ground Attack Regiment
ODNOTSENOV, G. P.	6/29/45	Lieutenant, Flight Commander, 951st Ground Attack Regiment
OKRESTIN, B. S.	4/13/44	Senior Lieutenant, Deputy Squadron Commander, 74th Guards Ground Attack Regiment
OLEYNIK, G. N.	8/24/43	Captain, Deputy Commander for Aerial Gunnery Service, 293rd Fighter Regiment
OLEYNIKOV, V. S.	6/27/45	Lieutenant, Flight Commander, 143rd Ground Attack Regiment
OLEYNICHENKO, D. YE.	8/18/45	Captain, Squadron Commander, 189th Guards Ground Attack Regiment
OLEPIR, A. I.	8/18/45	Senior Lieutenant, Flight Commander, 657th Ground Attack Regiment
OLOVYANNIKOV, N. YE.	10/26/44	Lieutenant, Flight Commander, 312th Ground Attack Regiment
OL'KHOVSKIY, N. I.	2/4/44	Major, Squadron Commander, 193rd Fighter Regiment
OMIGOV, I. F.	8/18/45	Lieutenant, Flier, 828th Ground Attack Regiment
ONISKEVICH, G. D.	7/1/44	Senior Lieutenant, Deputy Squadron Commander, 164th Fighter Regiment
ONISHCHENKO, V. P.	6/29/45	Senior Lieutenant, Flight Navigator, 134th Guards Bomber Regiment
ONOPCHENKO, N. M.	5/15/46	Senior Lieutenant, Squadron Commander, 163rd Guards Fighter Regiment /555
ONUFRIENKO, G. D.	4/12/42	Senior Lieutenant, Squadron Commander, 129th Fighter Regiment
OPADCHIY, F. F.	2/7/57	Colonel, Test Pilot

OPALEV, V. N.	4/13/44	Senior Lieutenant, Squadron Commander, 622nd Ground Attack Regiment
OPROKIDNEV, B. K.	5/15/46	Senior Lieutenant, Observation Pilot, 511th Independent Air Observation Regiment
OPRYSHKO, N. A.	6/27/45	Senior Lieutenant, Flight Commander, 155th Guards Ground Attack Regiment
AREKHOV, V. A.	5/1/43	Senior Lieutenant, Flight Commander, 32nd Guards Fighter Regiment
ORLOV, A. I.	6/27/45	Senior Lieutenant, Squadron Commander, 5th Guards Fighter Regiment
ORLOV, V. N.	9/28/43	Captain, Navigator, 133rd Guards Fighter Regiment
ORLOV, V. D.	5/31/45	Senior Lieutenant, Flight Commander, 98th Independent Air Observation Regiment
ORLOV, K. N.	4/7/40	Captain, Squadron Commander, 31st High Speed Bomber Regiment
ORLOV, L. A.	8/29/39	Senior Lieutenant, Deputy Squadron Commander, 70th Fighter Regiment
ORLOV, M. P.	6/29/45	Major, Squadron Navigator, 7th Guards Air Regiment Long-Range Aviation
ORLOV, M. YA.	5/15/46	Captain, Squadron Navigator, 336th Bomber Regiment
ORLOV, P. I.	7/27/43	Captain, Deputy Squadron Commander, 2nd Guards Fighter Regiment Air Forces Northern Fleet
ORLOV, P. I.	8/18/45	Lieutenant, Flight Commander, 707th Ground Attack Regiment
ORLOV, F. N.	7/21/42	Captain, Detachment Commander, 21st Independent Heavy Bomber Squadron
ORLOV, YA. N.	2/23/45	Senior Lieutenant, Flight Commander, 11th Independent Air Observation Regiment
OSADCHIYEV, A. D.	5/15/46	Senior Lieutenant, Squadron Commander, 43rd Fighter Regiment
OSADCHIY, A. P.	6/27/45	General Major of Aviation, Commander, 11th Guards Fighter Division

OSIPENKO, A. S.	2/22/39	Colonel, Deputy Commander of Troops for the Air Forces Moscow Military District	
OSIPENKO, P. D.	11/2/38	The Second Pilot of the "Rodina" Aircraft	
OSIPOV, A. M.	8/18/45	Captain, Squadron Commander, 569th Ground Attack Regiment	
OSIPOV, V. V.	6/29/45	Senior Lieutenant, Deputy Squadron Commander, 108th Guards Air Regiment Long-Range Aviation	
OSIPOV, M. M.	6/6/42	Lieutenant, Flight Commander, 8th Fighter Regiment	
OSKALENKO, D. YE.	2/14/43	Senior Lieutenant, Flight Commander, 26th Fighter Regiment Air Defense	
OSTAYEV, A. YE.	3/21/40	Senior Lieutenant, Flier, 58th Air Regiment	
OSTAPENKO, I. P.	2/23/45	Captain, Squadron Commander, 7th Guards Ground Attack Regiment	
OSTRYAKOV, N. A.	6/14/42	General Major of Aviation, Commander of the Air Forces Black Sea Fleet	
OSYKA, D. V.	7/22/44	Captain, Deputy Regiment Commander for Flight Preparation, 46th Ground Attack Regiment	
OS'KIN, D. P.		Major	
OKHAY, G. U.		Captain	
PAVKIN, I. M.	2/23/48	Major, Squadron Commander, 15th Guards Air Regiment Long-Range Aviation	
PAVLENKO, N. N.	2/23/45	Senior Lieutenant, Squadron Commander, 91st Guards Ground Attack Regiment	
PAVLOV, A. G.	9/28/43	Captain, Squadron Commander, 41st Guards Fighter Regiment	/556
PAVLOV, A. N.	4/10/45	Senior Lieutenant, Flight Commander, 156th Guards Fighter Regiment	
PAVLOV, B. G.		Major	
PAVLOV, V. G.	8/19/44	Senior Lieutenant, Flight Navigator, 6th Guards Air Regiment Long-Range Aviation	

PAVLOV, V. F.	6/29/45	Lieutenant, Aircraft Commander for Special Transport Squadron
PAVLOV, G. V.	3/6/45	Major, Commander, 46th Ground Attack Regiment Air Forces Northern Fleet
PAVLOV, C. R.	9/2/43	Senior Lieutenant, Deputy Squadron Commander, 42nd Guards Fighter Regiment
PAVLOV, I. D.	8/18/45	Captain, Squadron Commander, 165th Guards Ground Attack Regiment
PAVLOV, I. M.	2/23/45	Lieutenant, Flight Commander, 210th Ground Attack Regiment
PAVLOV, L. P.	10/25/43	Junior Lieutenant, Flier, 76th Guards Ground Attack Regiment
PAVLOV, M. N.	4/13/44	Senior Lieutenant, Squadron Navigator, 128th Bomber Regiment
PAVLOV, N. D.	10/26/44	Junior Lieutenant, Lead Plane Radio Gunnery, 4th Guards Bomber Division
PAVLOV, P. I.	11/5/44	Lieutenant Colonel, Commander, 21st Fighter Regiment Air Forces Red Banner Baltic Fleet
PAVLOV, P. I.	7/22/44	Captain, Squadron Commander, 21st Fighter Regiment Air Forces Red Banner Baltic Fleet
PAVLOVSKIY, I. M.	8/18/45	Captain, Deputy Squadron Commander, 659th Fighter Regiment
PAVLUSHKIN, N. S.	7/1/44	Senior Lieutenant, Squadron Commander, 402nd Fighter Regiment
PAVLYUCHENKO, I. V.	10/26/44	Major, Squadron Commander, 525th Ground Attack Regiment
PADALKO, B. M.	8/18/45	Captain, Squadron Commander, 683rd Ground Attack Regiment
PALAGIN, V. S.	5/15/46	Captain, Squadron Commander, 188th Guards Ground Attack Regiment
PALIY, F. P.	4/19/45	Major, Commander, 135th Guards Bomber Regiment
PANIN, . . V.	9/2/43	Junior Lieutenant, Flight Commander, 82nd Guards Bomber Regiment

PANIN, I. I.	7/1/44	Major, Navigator, 210th Ground Attack Regiment
PANIN, P. A.	1/22/44	Major, Commander, 255th Fighter Regiment Air Forces Northern Fleet
PANICHKIN, M. S.	5/15/46	Captain, Assistant Navigator, 19th Guards Bomber Regiment Long-Range Aviation
PANICHKIN, N. S.	5/15/46	Captain, Deputy Navigator, 329th Air Regiment Long-Range Aviation
PANKOV, I. M.	8/18/45	Senior Lieutenant, Squadron Commander, 783rd Ground Attack Regiment
PANKRATOV, S. S.	8/2/44	Major, Navigator, 66th Fighter Regiment
PANOV, A. B.	2/23/45	Lieutenant Colonel, Commander, 67th Guards Fighter Regiment
PANOV, A. D.	2/23/45	Lieutenant, Deputy Squadron Commander, 766th Ground Attack Regiment
PANOV, N. A.	12/31/42	Captain, Flight Commander, 5th Guards Air Regiment Long-Range Aviation
PANOV, P. G.	8/18/45	Lieutenant, Deputy Squadron Commander, 103rd Ground Attack Regiment
PANTEL'KIN, A. A.	8/18/45	Captain, Squadron Commander, 116th Fighter Regiment
PANFILOV, A. G.	8/18/45	Captain, Squadron Commander, 198th Ground Attack Regiment /557
PANFILOV, V. D.	12/17/41	Lieutenant, Squadron Commander, 225th Short Range Bomber Regiment
PANCHENKO, K. P.	2/23/45	Senior Lieutenant, Squadron Commander, 565th Ground Attack Regiment
PAPIVIN, N. F.	4/19/45	General Colonel of Aviation, Commander, 3rd Air Army
PAPAKHIN, YE. D.	6/29/45	Captain, Flight Commander, 10th Guards Air Regiment
PARASHCHENKO, F. K.	9/18/43	Captain, Flight Commander, 10th Guards Air Regiment

PARFENOVA, Z. I.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 46th Guards Night Bomber Regiment
PARSHIN, F. I.	10/26/44	Captain, Squadron Commander, 128th Bomber Regiment
PASECHNIK, A. S.	4/2/40	Senior Political Officer, Squadron Military Commissar, 44th Fighter Regiment
PASTUKHOV, G. F.	5/15/46	Senior Lieutenant, Flight Commander, 525th Ground Attack Regiment
PASYNKOV, G. V.	5/31/44	Lieutenant, Deputy Squadron Commander, 12th Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
PAS'KO, YE. B.	10/26/44	Senior Lieutenant, Squadron Navigator, 46th Guards Bomber Regiment
PAS'KO, N. F.	8/18/45	Senior Lieutenant, Squadron Commander, 28th Guards Fighter Regiment
PAKHOMOV, A. K.		Colonel
PAKHOTISHCHEV, N. D.	6/29/45	Captain, Squadron Navigator, 22nd Guards Bomber Regiment
PASHKEVICH, A. V.	2/23/45	Major, Squadron Commander, 63rd Guards Fighter Regiment
PASHKOV, I. D.	6/27/45	Senior Lieutenant, Flight Commander, 82nd Guards Bomber Regiment
PASHCHENKO, I. V.	8/18/45	Lieutenant, Flight Commander, 707th Ground Attack Regiment
PEN'KOV, M. I.	10/26/44	Lieutenant, Flight Commander, 431st Ground Attack Regiment
PEPELYAYEV, YE. G.		Colonel
PEREGUDOV, A. I.	2/4/44	Captain, Squadron Navigator, 34th Guards Bomber Regiment
PERELET, A. D.		Major
PEREPELITSA, A. M.	11/20/41	Junior Lieutenant, Flight Commander, 44th Fighter Division

PERESUMKIN, P. P.	8/18/45	Captain, Squadron Commander, 149th Fighter Regiment	
PERESYPKIN, F. I.	2/23/48	Senior Lieutenant, Deputy Squadron Commander, 95th Guards Ground Attack Regiment	
PERMINOV, I. A.	5/15/46	Lieutenant, Flight Commander, 33rd Guards Ground Attack Regiment	
PERSHUTOV, I. V.	10/26/44	Lieutenant, Deputy Squadron Commander, 525th Ground Attack Regiment	
PESKOV, P. I.	5/5/42	Captain, Flight Commander, 5th Guards Fighter Regiment	
PESTROV, B. A.	10/26/44	Lieutenant, Deputy Squadron Commander, 166th Guards Ground Attack Regiment	
PETELIN, YU. N.	6/20/42	Senior Lieutenant, Flight Commander, 98th Bomber Regiment Long-Range Aviation	
PETRENKO, YE. V.	8/19/44	Captain, Squadron Commander, 20th Fighter Regiment Air Forces Northern Fleet	
PETROV, A. I.	10/26/44	Lieutenant, Flight Commander, 155th Guards Ground Attack Regiment	
PETROV, A. F.	3/25/43	Senior Lieutenant, Flight Navigator, 752nd Air Regiment Long-Range Aviation	
PETROV, G. G.	1/16/42	Captain, Squadron Commander, 154th Fighter Regiment	/558
PETROV, D. N.	2/23/45	Senior Lieutenant, Squadron Commander, 175th Ground Attack Regiment	
PETROV, I. I.	2/4/44	Senior Lieutenant, Deputy Squadron Commander, 211th Ground Attack Regiment	
PETROV, N. S.	6/27/45	Lieutenant, Flight Commander, 141st Guards Ground Attack Regiment	
PETROV, P. M.	4/7/40	Captain, Squadron Commander, 68th Fighter Regiment	
PETRUSHEVICH, V. V.	5/15/46	Captain, Squadron Commander, 27th Guards Air Regiment Long-Range Aviation	
PETUSHKOV, A. S.	8/19/44	Lieutenant Colonel, Deputy Commander, 3rd Guards Air Regiment Long-Range Aviation	

PECHENYY, N. N.	5/15/46	Major, Squadron Commander, 42nd Guards Fighter Regiment
PESHKOV, V. N.	5/20/40	Senior Lieutenant, Lead Plane Navigator, 49th Fighter Regiment
PESHCHENKO, A. S.	5/15/46	Lieutenant, Flight Commander, 451st Ground Attack Regiment
PIVNYUK, N. V.	1/30/43	Senior Lieutenant, Flight Commander, 128th Bomber Regiment
PIVOVAROV, M. YE.	5/15/46	Senior Lieutenant, Squadron Commander, 402nd Fighter Regiment
PIDTYKAN, I. D.	6/6/42	Senior Lieutenant, Flight Commander, 123rd Fighter Regiment
PILIPENKO, I. M.	12/13/42	Captain, Squadron Commander, 40th Fighter Regiment
PILYUTOV, P. A.	2/10/43	Captain, Deputy Commander, 154th Fighter Regiment
PINCHUK, G. S.	2/7/40	Lieutenant, Flier, 40th Air Regiment Air Forces Black Sea Fleet
PINCHUK, N. G.	4/19/45	Captain, Deputy Squadron Commander, 18th Guards Fighter Regiment
PIROGOV, V. V.	2/22/44	Senior Lieutenant, Deputy Squadron Commander, 9th Guards Bomber Regiment Air Forces, Northern Fleet
PIROZHKOV, B. G.	2/14/43	Senior Lieutenant, Squadron Commander, 787th Fighter Regiment Air Defense
PISAREV, G. V.	3/6/45	Captain, Squadron Navigator, 36th Mine Torpedo Air Regiment Air Forces Northern Fleet
PISAREVSKIY, N. F.	2/23/45	Senior Lieutenant, Flight Commander, 218th Ground Attack Regiment
PISKUNOV, V. G.	4/13/44	Senior Lieutenant, Deputy Squadron Commander, 232nd Ground Attack Regiment
PICHUGIN, YE. I.	2/14/43	Junior Lieutenant, Flier, 441st Fighter Regiment Air Defense

PISHKAN, I. A.	11/1/43	Captain, Squadron Commander, 31st Guards Fighter Regiment
PLATONOV, K. P.	3/13/44	Senior Lieutenant, Deputy Squadron Commander, 108th Air Regiment Long-Range Aviation
PLATONOV, N. YE.	8/2/44	Senior Lieutenant, Deputy Squadron Commander, 672nd Ground Attack Regiment
PLATONOV, N. YE.	8/18/45	Lieutenant, Flight Commander, 826th Ground Attack Regiment
PLASHKIN, B. I.	7/21/42	Senior Lieutenant, Flight Navigator, 514th Dive Bomber Regiment
PLASHCHEV, YU. T.		Major
PLEKHANOV, A. F.	5/15/46	Captain, Deputy Squadron Commander, 73rd Guards Fighter Regiment
PLEKHANOV, I. YE.	1/28/43	Captain, Deputy Squadron Commander, 158th Fighter Regiment
PLESHAKOV, A. YA.	2/23/45	Lieutenant, Flier, 7th Guards Ground Attack Regiment
PLESHAKOV, A. S.	5/15/46	Major, Squadron Commander, 703rd Ground Attack Regiment /559
PLOTKIN, M. N.	8/13/41	Captain, Deputy Squadron Commander, 1st Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
PLOKHOV, A. A.	3/13/44	Lieutenant, Aircraft Commander, 7th Guards Air Regiment, Long-Range Aviation
PLYASHECHNIK, YA. I.	6/20/42	Captain, Detachment Commander, 1st Air Regiment Long-Range Aviation
POGORELOV, V. P.	7/21/42	Senior Lieutenant, Deputy Commander, 240th Squadron
POGORELOV, M. S.	8/18/45	Captain, Squadron Commander, 4th Fighter Regiment
PODKOLODNOV, V. G.	9/8/43	Captain, Deputy Squadron Commander, 72nd Air Observation Regiment
PODSADNIK, N. G.	8/18/45	Lieutenant, Flight Commander, 165th Guards Ground Attack Regiment

POZDNYAKOV, A. P.	8/10/45	Senior Lieutenant, Squadron Navigator, 125th High Speed Bomber Regiment
POZDNYAKOV, A. P.	6/6/42	Lieutenant, Flight Commander, 147th Fighter Regiment
POZDNYAKOV, K. F.	8/24/43	Lieutenant, Flier, 167th Fighter Regiment
POKALO, M. F.	7/24/43	Senior Lieutenant, Flight Navigator, 24th Air Regiment, Air Forces Northern Fleet
POKACHALOV, N. N.	3/13/44	Major, Squadron Navigator, 101st Air Regiment Long-Range Aviation
POKLIKUSHKIN, A. V.	7/1/44	Lieutenant, Flight Commander, 74th Guards Ground Attack Regiment
POKOLODNYY, V. D.	2/14/43	Senior Lieutenant, Flight Commander, 21st Short-Range Bomber Regiment
POKROVSKIY, V. P.	7/24/43	Captain, Flight Commander, 2nd Guards Fighter Regiment Air Forces Northern Fleet
POLAGUSHIN, N. I.	4/19/45	Captain, Squadron Commander, 15th Guards Ground Attack Regiment
POLEVOY, I. S.	2/23/45	Major, Deputy Commander, 132nd Bomber Regiment
POLEZHAYEV, S. A.	3/13/44	Major, Squadron Commander, 16th Guards Air Regiment Long-Range Aviation
POLOGOV, P. A.	9/2/43	Major, Navigator, 737th Fighter Regiment
POLUKAROV, N. T.	4/10/45	Lieutenant, Flight Commander, 140th Guards Ground Attack Regiment
POLUNIN, A. I.	8/18/45	Senior Lieutenant, Squadron Commander, 118th Guards Ground Attack Regiment
POLUYANOV, G. P.	4/19/45	Senior Lieutenant, Deputy Squadron Commander, 136th Guards Ground Attack Regiment
POLYGALOV, P. A.	11/5/44	Major, Navigator, 22nd Guards Air Regiment Long-Range Aviation
POLYNIN, F. P.	11/14/38	Colonel, Student at the N. Ye. Zhukovskiy Academy

POLYAKOV, V. K.	9/2/43	Junior Lieutenant, Flier, 54th Guards Fighter Regiment
POLYAKOV, I. M.	11/18/44	Senior Lieutenant, Flight Commander, 907th Fighter Regiment
POLYAKOV, P. YA.	2/23/45	Senior Lieutenant, Flight Commander, 74th Guards Ground Attack Regiment
PALYAKOV, S. N.	2/10/43	Major, Commander, 174th Ground Attack Regiment
POMAZUNOV, A. I.	6/27/45	Major, Navigator, 1st Guards Bomber Division
POMESHCHIK, V. I.	8/18/45	Junior Lieutenant, Flier, 103rd Ground Attack Regiment
POMUKCHINSKIY, D. I.	2/23/45	Major, Deputy Commander, 949th Ground Attack Regiment
PONOMAREV, V. M.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 95th Guards Ground Attack Regiment
PONOMARENKO, A. N.	3/25/43	Senior Lieutenant, Aircraft Commander, 4th Guards Air Regiment Long-Range Aviation /560
PONOMARENKO, I. N.	7/22/44	Major, Deputy Commander, 51st Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
PONOMARCHUK, S. YE.	2/5/40	Senior Political Officer, Squadron Military Commissar, 5th High Speed Bomber Unit
PONOMAREV, M. S.		Captain
POPKOV, B. Z.		Colonel
POPOV, A. V.	10/22/41	Junior Lieutenant, Flier, 29th Fighter Regiment
POPOV, A. F.	5/15/46	Captain, Squadron Navigator, 15th Guards Air Regiment Long-Range Aviation
POPOV, A. P.	2/23/45	Lieutenant, Flight Commander, 43rd Guards Ground Attack Regiment

POPOV, A. F.	2/4/44	Captain, Deputy Squadron Commander, 47th Guards Air Regiment
POPOV, A. I.	4/13/44	Senior Lieutenant, Flight Commander, 65th Guards Fighter Regiment
POPOV, A. K.	3/13/44	Senior Lieutenant, Aircraft Commander, 14th Guards Air Regiment Long-Range Aviation
POPOV, V. A.		Captain
POPOV, G. T.	11/5/44	Senior Lieutenant, Squadron Commander, 47th Ground Attack Regiment Air Forces Red Banner Baltic Fleet
POPOV, N. I.	5/15/46	Captain, Squadron Commander, 724th Ground Attack Regiment
POPOVA, A. V.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 46th Guards Air Regiment
POPOVICH, V. T.	5/15/46	Senior Lieutenant, Squadron Commander, 44th Guards Bomber Regiment
POPOVICH, P. R.		Lieutenant Colonel, Cosmonaut
POPOVICH, G. D.	9/14/45	Major, Deputy Commander, 4th Mine Torpedo Air Regiment Air Forces Pacific Ocean Fleet
POSPELOV, P. P.	2/4/44	Major, Deputy Commander, 58th Guards Ground Attack Regiment
POSTNOV, A. A.	8/24/43	Senior Lieutenant, Squadron Commander, 88th Fighter Regiment
POTAPOV, A. S.	6/14/42	Lieutenant, Flight Commander, 57th Bomber Regiment Air Forces Red Banner Baltic Fleet
POTAPOV, P. M.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 873rd Ground Attack Regiment
POTAPOV, S. I.	4/19/45	Lieutenant, Flight Commander, 15th Guards Ground Attack Regiment
POKHLEBAYEV, I. G.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 101st Fighter Regiment
POSHIVAL'NIKOV, S. D.	7/1/44	Captain, Squadron Commander, 800th Ground Attack Regiment

POYUSHCHEV, A. I.	8/18/45	Captain, Squadron Commander, 118th Guards Ground Attack Regiment
PREOBRAZHENSKIY, YE. N.	8/13/41	Colonel, Commander, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
PRESNYAKOV, A. V.	7/22/44	Senior Lieutenant, Flight Commander, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
PRIBYLOV, N. A.	6/29/45	Lieutenant, Flight Commander, 672nd Ground Attack Regiment
PRIKAZCHIKOV, A. L.	5/1/43	Captain, Squadron Commander, 42nd Guards Fighter Regiment
PRIMAKIN, I. V.	6/29/45	Lieutenant, Flight Commander, 951st Ground Attack Regiment
PROKOPENKO, G. N.	9/8/43	Major, Navigator, 3rd Guards Fighter Regiment
PROKOF'YEV, V. P.	5/15/46	Captain, Assistant Navigator, 18th Guards Bomber Regiment Long-Range Aviation
PROKOF'YEV, G. M.	6/27/37	Major, Deputy Navigator for the Air Forces of the Workers and Peasants Red Army
PROKUDIN, A. N.	8/19/44	Captain, Flight Navigator, 108th Air Regiment Long-Range Aviation /561
PROSANDEYEV, I. K.	5/15/46	Captain, Squadron Commander, 91st Guards Ground Attack Regiment
PROSVETOV, P. D.	6/29/45	Senior Lieutenant, Squadron Navigator, 23rd Guards Air Regiment Long-Range Aviation
PROSVIRNOV, M. A.	5/15/46	Captain, Squadron Commander, 175th Guards Ground Attack Regiment
PROSKUROV, I. I.	6/21/37	Major, Air Brigade Commander
PROTCHEV, V. I.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 76th Guards Ground Attack Regiment
PROKHOROV, YE. P.	2/23/45	Senior Lieutenant, Squadron Commander, 210th Ground Attack Regiment

PROSHENKOV, N. I.	6/27/45	Major, Squadron Commander, 69th Guards Fighter Regiment
PROSHCHAYEV, G. M.	10/26/44	Lieutenant, Squadron Commander, 235th Ground Attack Regiment
PRUDNIKOV, D. T.	2/4/44	Lieutenant, Squadron Commander, 75th Guards Ground Attack Regiment
PRUTKOV, S. D.	5/1/43	Major, Commander, 504th Ground Attack Regiment
PRYAZHENNIKOV, A. P.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 90th Guards Ground Attack Regiment
PTUKHIN, YE. S.	3/21/40	Corps Commander, Commander of the Air Forces Leningrad Military District
PULOV, G. I.		Lieutenant Colonel
PUMPUR, P. I.	7/4/37	Brigade Commander, Chief of the Directorate for the Military Preparation for the Air Force
PURGIN, N. I.	10/26/44	Lieutenant, Flight Commander, 155th Guards Ground Attack Regiment
PUSYP, E. K.	6/20/42	Major, Aircraft Commander, 746th Air Regiment Long-Range Aviation
PUTILIN, M. T.	6/29/45	Major, Squadron Commander, 74th Guards Ground Attack Regiment
PUTIN, A. D.	6/27/45	Senior Lieutenant, Squadron Commander, 624th Ground Attack Regiment
PUT'KO, N. S.	6/24/45	Senior Lieutenant, Deputy Squadron Commander, 106th Guards Fighter Regiment
PUCHKOV, G. I.	5/15/46	Senior Lieutenant, Flight Commander, 70th Guards Ground Attack Regiment
PUSHKIN, A. I.	8/12/42	Major, Commander, 52nd Short Range Bomber Regiment
PUSHKIN, N. P.	9/2/43	Senior Lieutenant, Squadron Commander, 2nd Guards Fighter Regiment
PUSHCHIN, M. N.	2/23/45	Captain, Pilot-Inspector, 5th Guards Bomber Division

PCHELKIN, A. I.	6/27/45	Senior Lieutenant, Flight Commander, 5th Guards Fighter Regiment
PYLAYEV, YE. A.	10/26/44	Captain, Deputy Commander, 159th Guards Fighter Regiment
PYRKOV, YU. I.	6/29/45	Senior Lieutenant, Flight Commander, 134th Guards Bomber Regiment
PYSIN, N. V.	8/19/44	Captain, Squadron Commander, 8th Guards Ground Attack Regiment
P'YANKOV, A. P.	11/17/39	Lieutenant, Flight Commander, 22nd Fighter Regiment
PYATERI, I. V.	4/19/45	Captain, Deputy Commander, 276th Guards Ground Attack Regiment
PYATYKHIN, I. G.	4/7/40	Colonel, Commander, 15th High Speed Bomber Brigade
RADUGIN, F. G.	2/23/48	Senior Lieutenant, Aircraft Commander, 1st Air Transport Regiment
RADUS, F. N.	4/21/40	Captain, Squadron Commander, 55th Bomber Regiment, Air Forces Red Banner Baltic Fleet
RADCHUK, P. P.	7/27/43	Lieutenant Colonel, Squadron Commander, 8th Guards Air Regiment Long-Range Aviation /562
RAZGONIN, A. I.	1/22/44	Senior Lieutenant, Flier, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
RAZIN, I. P.	8/18/45	Lieutenant, Flier, 639th Ground Attack Regiment
RAKOV, A. V.	10/26/44	Lieutenant, Flight Commander, 165th Ground Attack Regiment
RASKOVA, M. M.	11/2/38	Captain, Navigator of the "Rodina" Aircraft
RASNITSOV, A. M.	6/27/45	Lieutenant, Flight Commander, 144th Guards Ground Attack Regiment
RASPOPOVA, N. M.	5/15/46	Senior Lieutenant, Flight Commander, 46th Guards Night Bomber Regiment

RASSADKIN, P. A.	5/31/44	Captain, Deputy Squadron Commander, 255th Fighter Regiment Air Forces Northern Fleet
RASSOKHIN, L. V.	3/13/44	Senior Lieutenant, Aircraft Commander, 4th Guards Air Regiment Long-Range Aviation
RATNIKOV, P. P.	8/24/43	Lieutenant, Squadron Commander, 53rd Guards Fighter Regiment
RAKHOV, V. G.	8/29/39	Senior Lieutenant, Flier for the Scientific Research Institute of the Air Force
ROCHKOV, I. I.	3/6/45	Junior Lieutenant, Flight Navigator, 51st Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
PACHKOV, P. A.	8/18/45	Captain, Squadron Commander, 955th Ground Attack Regiment
RASHCHEPKIN, V. D.	7/1/44	Lieutenant, Squadron Commander, 61st Ground Attack Regiment
REDCHENKOV, P. S.	6/29/45	Major, Squadron Commander, 989th Ground Attack Regiment
REZNICHENKO, I. I.	8/18/45	Major, Navigator, 810th Ground Attack Regiment
RENZEYEV, A. I.	3/6/45	Captain, Squadron Navigator, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
RENTS, M. P.	5/15/46	Major, Squadron Commander, 30th Guards Fighter Regiment
REPIN, A. I.	8/19/44	Major, Deputy Squadron Commander, 9th Guards Air Regiment Long-Range Aviation
REPNIKOV, N. F.	2/22/43	Senior Lieutenant, Squadron Commander, 152nd Fighter Regiment
RESHETNIKOV, V. V.	7/27/43	Captain, Squadron Commander, 19th Guards Air Regiment Long-Range Aviation
RESHETOV, A. M.	5/1/43	Captain, Squadron Commander, 31st Guards Fighter Regiment
RESHIDOV, A. I.	6/27/45	Major, Deputy Commander, 162nd Guards Bomber Regiment

RZHAVSKIY, N. KH.	2/10/43	Lieutenant, Flight Commander, 153rd Fighter Regiment
RIVKIN, B. M.	8/24/43	Captain, Squadron Commander, 54th Guards Fighter Regiment
RIDNYY, S. G.	8/9/41	Junior Lieutenant, Flight Commander, 126th Fighter Regiment
ROGOV, A. G.	10/22/41	Captain, Squadron Commander, 40th Air Regiment Long-Range Aviation
ROGOZHIN, A. A.	4/10/45	Lieutenant, Squadron Commander, 142nd Guards Ground Attack Regiment
ROGOZHIN, V. A.	8/24/43	Junior Lieutenant, Flight Commander, 236th Fighter Regiment
ROGUL'SKIY, F. N.	8/19/44	Captain, Squadron Commander, 19th Guards Air Regiment Long-Range Aviation
RODIN, N. I.	6/29/45	Senior Lieutenant, Deputy Squadron Commander, 525th Ground Attack Regiment
RODINKA, S. L.	8/2/44	Senior Lieutenant, Squadron Commander, 93rd Guards Ground Attack Regiment
RODIONOV, V. I.	5/15/46	Major, Squadron Commander, 20th Guards Air Regiment Long-Range Aviation /563
RODIONOV, M. A.	2/14/43	Junior Lieutenant, Flight Commander, 562nd Fighter Regiment Air Defense
RODNYKH, M. V.	3/25/43	Captain, Deputy Squadron Commander, 890th Air Regiment Long-Range Aviation
ROZHKOV, A. YE.	3/6/45	Captain, Deputy Squadron Commander, 30th Air Observation Regiment Air Forces Black Sea Fleet
ROZHNOV, N. A.	7/1/44	Captain, Navigator, 217th Ground Attack Regiment
ROLIN, N. M.	6/29/45	Senior Lieutenant, Squadron Navigator, 34th Guards Bomber Regiment
ROMANENKO, A. S.	9/28/43	Major, Navigator, 91st Fighter Regiment
ROMANENKO, V. S.	7/21/42	Captain, Squadron Commander, 502nd Ground Attack Regiment

ROMANENKO, I. G.	4/21/40	Major, Commander, 61st Fighter Brigade, Air Forces Red Banner Baltic Fleet
ROMANENKO, I. I.	2/4/44	Captain, Navigator, 774th Fighter Regiment
ROMANOV, V. F.	8/19/44	Captain, Flight Navigator, 18th Guards Air Regiment Long-Range Aviation
ROMANOV, YE. P.	8/18/45	Senior Lieutenant, Observation Pilot, 47th Independent Air Observation Regiment
ROMANOV, M. YA.	6/29/45	Senior Lieutenant, Squadron Commander, 565th Ground Attack Regiment
ROMANOV, P. I.	8/19/44	Captain, Flight Commander, 108th Air Regiment Long-Range Aviation
ROMANOV, S. M.	6/20/42	Major, Navigator, 746th Air Regiment Long-Range Aviation
ROMANYUK, V. T.		Colonel
ROMASHKIN, T. T.		Senior Lieutenant
ROSSOKHIN, B. G.	2/23/45	Lieutenant, Flight Commander, 59th Guards Ground Attack Regiment
ROSHCHENKO, V. F.	7/27/43	Lieutenant, Squadron Navigator, 8th Guards Air Regiment Long-Range Aviation
ROSHCHIN, L. M.	10/26/44	Senior Lieutenant, Squadron Commander, 190th Ground Attack Regiment
RUBAN, A. F.	8/18/45	Major, Navigator, 990th Night Bomber Regiment
RUBANOV, P. A.	8/18/45	Captain, Squadron Commander, 828th Ground Attack Regiment
RUBAKHIN, A. YE.	2/23/45	Major, Commander, 402nd Fighter Regiment
RUBTSOV, A. P.	12/31/42	Captain, Flight Commander, 4th Air Regiment Long-Range Aviation
RUDENKO, A. YE.	8/18/45	Lieutenant, Flight Commander, 7th Guards Ground Attack Regiment
RUDENKO, A. A.	2/23/45	Captain, Flight Commander, 164th Independent Air Observation Regiment

RUDEN· , N. S.	6/29/45	Senior Lieutenant, Flier, 176th Guards Fighter Regiment	
RUDENKO, P. I.	12/13/42	Lieutenant, Deputy Squadron Commander, 7th Guards Ground Attack Regiment	
RUDENKO, S. I.	8/19/44	General Colonel of Aviation, Commander, 16th Air Army	
RUDNEVA, YE. M.	10/26/44	Senior Lieutenant, Navigator, 46th Guards Night Bomber Regiment	
RUDNOV, A. A.	6/29/45	Senior Lieutenant, Flight Commander, 683rd Ground Attack Regiment	
RUD', N. M.	10/26/44	Lieutenant, Flier, 745th Bomber Regiment	
RUZHIN, V. M.	8/18/45	Senior Lieutenant, Squadron Commander, 367th Bomber Regiment	
EUKAVITSYN, V. P.	5/16/44	Captain, Flight Commander, 36th Mine Torpedo Air Regiment Air Forces Black Sea Fleet	
RUMYANTSEV, M. I.	7/1/44	Senior Lieutenant, Deputy Squadron Commander, 218th Ground Attack Regiment	
RUMYANTSEV, F. S.	11/5/44	Captain, Squadron Navigator, 22nd Guards Air Regiment	/564
RYSANOV, I. F.	2/23/45	Captain, Observation Pilot, 11th Independent Air Observation Regiment	
RYBAK, M. I.	6/29/45	Lieutenant, Flier, 951st Ground Attack Regiment	
RYBAKOV, A. V.	8/18/45	Lieutenant, Flight Commander, 569th Ground Attack Regiment	
RYBAKOV, A. F.	4/10/45	Lieutenant, Flight Commander, 142nd Guards Ground Attack Regiment	
RYBIN, I. P.	8/24/43	Major, Navigator, 148th Fighter Regiment	
RYBIN, N. I.	6/29/45	Major, Squadron Commander, 32nd Guards Air Regiment Long-Range Aviation	
RYBKO, N. S.			
RYZHIY, L. K.	5/15/46	Captain, Squadron Commander, 347th Fighter Regiment	

RYZHKOV, V. S.	8/2/44	Senior Lieutenant, Deputy Squadron Commander, 93rd Guards Ground Attack Regiment
RYZHOV, YE. M.	10/23/42	Captain, Flight Commander, 7th Air Regiment, Air Forces Black Sea Fleet
RYZHOV, M. I.	5/15/46	Lieutenant, Flight Commander, 103rd Ground Attack Regiment
RYKACHEV, YU. B.	2/10/42	Captain, Deputy Commander, 69th Fighter Regiment
RYKOV, L. V.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 44th Guards Bomber Regiment
RYKOV, K. K.		Colonel
RYTOV, A. I.	2/23/45	Captain, Squadron Commander, 946th Ground Attack Regiment
RYKHLIN, N. V.	5/24/43	Senior Lieutenant, Flight Commander, 805th Ground Attack Regiment
RYKHLOV, A. D.	5/16/44	Senior Lieutenant, Flight Commander, 36th Mine Torpedo Air Regiment Air Forces Black Sea Fleet
RYSHKOV, I. I.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 2nd Air Transport Regiment Civil Air Fleet
RYABOV, K. A.	10/26/44	Senior Lieutenant, Deputy Commander, 190th Ground Attack Regiment
RYABOV, M. T.	12/31/42	Captain, Aircraft Navigator, 4th Air Regiment Long-Range Aviation
RYABOV, S. I.	2/23/45	Senior Lieutenant, Flight Commander, 92nd Guards Ground Attack Regiment
RYABOVA, YE. V.	2/23/45	Senior Lieutenant, Squadron Navigator, 46th Guards Night Bomber Regiment
RYABOSHAPKA, V. YA.	7/21/42	Senior Sergeant, Pilot, 299th Ground Attack Regiment
RYABUSHKO, G. M.	8/18/45	Lieutenant, Flier, 828th Ground Attack Regiment

RYABTSEV, B. I.		Major
RYABTSEV, M. YE.	6/27/45	Senior Lieutenant, Flight Commander, 2nd Guards Fighter Regiment
RYABCHEVSKIY, M. F.	11/1/43	Major, Navigator, 807th Ground Attack Regiment
RYAZAITSEV, A. F.	2/23/45	Major, Navigator, 179th Guards Fighter Regiment
SAVEL'YEV, V. A.	5/1/43	Senior Lieutenant, Flight Commander, 2nd Guards Fighter Regiment
SAVEL'YEV, YE. P.	2/4/44	Senior Lieutenant, Deputy Squadron Commander, 106th Guards Fighter Regiment
SAVENKOV, N. K.	5/15/46	Senior Lieutenant, Flight Commander, 511th Independent Air Observation Regiment
SABOSHCHEV, I. I.	7/1/44	Major, Navigator, 8th Independent Air Observation Regiment
SAVUSHKIN, A. P.	9/2/43	Captain, Navigator, 11th Guards Fighter Regiment
SAVCHENKO, A. P.	2/4/44	Captain, Squadron Commander, 127th Fighter Regiment
SAVCHENKO, V. M.	4/21/40	Lieutenant, Flight Commander, 65th Independent Transport Regiment Naval Air Force
SAVCHENKO, P. P.	3/13/44	Major, Squadron Commander, 110th Air Regiment Long-Range Aviation /565
SADCHIKOV, F. I.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 826th Ground Attack Regiment
SAYEVICH, T. A.	2/23/45	Captain, Flight Commander, 11th Independent Air Observation Regiment
SALOV, A. M.	3/21/40	Junior Commander, Aerial Gunner, 50th High Speed Bomber Regiment
SALOV, M. V.	2/22/43	Lieutenant, Flight Commander, 65th Ground Attack Regiment
SALOMATIN, V. I.	2/22/43	Lieutenant, Flight Commander, 65th Ground Attack Regiment

SALOMATIN, M. I.	6/29/45	Lieutenant, Flight Commander, 683rd Ground Attack Regiment
SAMODELKIN, V. M.	5/15/46	Captain, Squadron Commander, 130th Guards Ground Attack Regiment
SAMOROKOV, N. N.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 70th Guards Ground Attack Regiment
SAMOYLOV, D. A.		Senior Lieutenant
SAMOKHVALOV, I. I.	10/26/44	Captain, Squadron Commander, 825th Ground Attack Regiment
SAMOKHVALOV, N. S.	4/28/43	Senior Lieutenant, Deputy Squadron Commander, 126th Fighter Regiment
SAMOKHIN, M. I.	6/29/45	General Colonel of Aviation, Commander of the Air Forces Red Banner Baltic Fleet
SAMOKHIN, N. YE.	9/2/43	Captain, Flight Commander, 11th Independent Air Observation Regiment
SAMOKHIN, P. YA.	2/22/43	Lieutenant, Flight Commander, 65th Ground Attack Regiment
SAMOCHKIN, A. V.	3/27/42	Lieutenant, Pilot, 289th Air Regiment
SAMSONOV, P. V.	2/23/45	Captain, Navigator, 723rd Ground Attack Regiment
SAMUSEV, N. N.	9/18/43	Captain, Aircraft Commander, 4th Guards Air Regiment Long-Range Aviation
SANDALOV, V. A.	6/6/42	Lieutenant Colonel, Commander, 125th High Speed Bomber Regiment
SANFIROVA, O. A.	2/23/45	Captain, Squadron Commander, 46th Guards Night Bomber Regiment
SAPOZHNIKOV, V. V.	8/19/44	Major, Squadron Commander, 336th Air Regiment Long-Range Aviation
SAPOZHNIKOV, M. A.	2/4/44	Junior Lieutenant, Flier, 48th Guards Independent Long-Range Observation Regiment
SARANCHEV, N. G.	1/19/40	Captain, Squadron Commander, 35th Air Regiment

SARYGIN, A. V.		Colonel
SAFONOV, V. I.	11/5/44	Captain, Squadron Commander, 8th Guards Air Regiment Long-Range Aviation
SAVONOV, F. M.	6/29/45	Junior Lieutenant, Flier, 74th Guards Ground Attack Regiment
SAFRONOV, S. I.	8/24/43	Captain, Squadron Commander, 293rd Fighter Regiment
SAKHAROV, P. I.	11/5/44	Captain, Squadron Commander, 78th Air Regiment
SACHKO, I. K.	7/22/44	Lieutenant, Flier, 51st Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
SACHKOV, M. I.	10/26/44	Captain, Squadron Commander, 728th Fighter Regiment
SVERTILOV, A. I.	2/23/45	Captain, Navigator, 807th Ground Attack Regiment
SVETLICHNYY, G. L.	5/1/43	Lieutenant, Flight Commander, 312th Ground Attack Regiment
SVIRIDOV, A. A.	4/13/44	Senior Lieutenant, Squadron Commander, 128th Bomber Regiment
SVIRCHEVSKIY, V. S.	8/24/43	Senior Lieutenant, Flight Commander, 11th Independent Air Observation Regiment
SVISTUNOV, A. I.	6/27/45	Captain, Squadron Commander, 213th Guards Fighter Regiment
SVITENKO, N. I.	2/10/43	Captain, Squadron Commander, 7th Fighter Regiment
SVYATOSHENKO, L. S.	6/27/45	Captain, Squadron Commander, 948th Ground Attack Regiment /566
SGIBNEV, P. G.	10/23/42	Senior Lieutenant, Squadron Commander, 78th Air Regiment Air Forces Northern Fleet
SDOBNOV, N. I.	8/[illegible]41	Captain, Squadron Commander, 48th Short-Range Bomber Regiment
SEBROVA, I. F.	2/23/45	Senior Lieutenant, Flight Commander, 46th Guards Night Bomber Regiment

SEVAST'YANOV, A. T.	6/6/42	Junior Lieutenant, Flight Commander, 26th Fighter Regiment
SEVAST'YANOV, I. G.		Major
SEVRYUKOV, L. I.	10/23/42	Sergeant, Pilot, 62nd Air Regiment, Air Forces Black Sea Fleet
SEDEL'NIKOV, P. I.	2/23/45	Senior Lieutenant, Flight Commander, 237th Ground Attack Regiment
SEDNENKOV, N. P.	10/26/44	Lieutenant, Flight Commander, 7th Guards Ground Attack Regiment
SEDOV, G. A.		
SEKIN, V. A.	8/18/45	Lieutenant, Flight Commander, 103rd Ground Attack Regiment
SELEZNEV, P. I.	7/22/44	Captain, Squadron Navigator, 118th Air Observation Regiment
SELIBANOV, YE. I.	8/18/45	Major, Navigator, 43rd Guards Ground Attack Regiment
SELIVANOV, I. P.	2/22/39	Captain, Squadron Navigator
SELIVERSTOV, K. YE.	3/27/42	Lieutenant, Flight Commander, 55th Fighter Regiment
SELIVETSTOV, F. P.	2/23/45	Captain, Deputy Squadron Commander, 10th Independent Air Observation Regiment
SELIFONOV, I. I.	6/27/45	Senior Lieutenant, Flight Commander, 106th Guards Fighter Regiment
SELYUTIN, A. M.	11/5/44	Lieutenant, Flier, 4th Guards Fighter Regiment, Air Forces Red Banner Baltic Fleet
SELYAGIN, I. N.	8/18/45	Senior Lieutenant, Squadron Commander, 6th Independent Guards Ground Attack Regiment
SELYANIN, YE. N.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 174th Guards Ground Attack Regiment
SEMAK, P. I.	2/23/45	Captain, Squadron Commander, 4th Guards Short-Range Bomber Regiment

SEMENISHIN, V. G.	5/24/43	Major, Navigator, 298th Fighter Regiment
SEMENOV, A. F.	3/21/40	Captain, Deputy Squadron Commander, 7th Fighter Regiment
SEMENOV, V. K.	6/29/45	Senior Lieutenant, Flier, 187th Independent Aerial Spotting Reconnaissance Regiment
SEMENOV, V. F.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 976th Fighter Regiment
SEMENOV, F. G.	2/4/44	Captain, Deputy Commander for Aerial Gunnery Service, 240th Fighter Regiment
SEMENTSOV, M. I.	9/28/43	Senior Lieutenant, Deputy Squadron Commander, 41st Guards Fighter Regiment
SEMENYUK, Z. V.	1/28/43	Captain, Pilot-Inspector of Pilot Technique, 220th Fighter Division
SEMENYUK, I. I.	7/1/44	Captain, Squadron Commander, 40th Guards Fighter Regiment
SENATOR, V. T.	9/18/43	Captain, Flight Navigator, 10th Guards Air Regiment Long-Range Aviation
SENAGIN, I. L.	11/5/44	Major, Squadron Commander, 14th Guards Air Regiment Long-Range Aviation
SENATOROV, A. S.	3/14/39	Colonel, Squadron Commander
SENCHENKO, V. P.	6/27/45	Captain, Deputy Squadron Commander, 1st Guards Fighter Regiment
SEN'KOV, T. G.	10/26/44	Captain, Squadron Navigator, 81st Guards Bomber Regiment /567
SERBIN, F. P.	6/27/45	Senior Lieutenant, Squadron Navigator, 80th Guards Bomber Regiment
SERBINENKO, N. I.	8/18/45	Lieutenant, Flight Commander, 707th Ground Attack Regiment
SERGEYEV, V. P.	10/26/44	Captain, Squadron Commander, 62nd Ground Attack Regiment
SERGEYEV, V. P.	2/4/44	Lieutenant, Flight Commander, 48th Independent Long-Range Air Observation Regiment

SERGEYENKOV, N. S.	9/2/43	Captain, Squadron Navigator, 99th Independent Air Observation Regiment
SERGOV, A. I.	9/28/43	Major, Navigator, 508th Fighter Regiment
SEREBRYAKOV, N. G.	5/7/40	Major, Commander, 5th High Speed Bomber Regiment
SEREGIN, V. G.	2/23/48	Major, Navigator, 303rd Fighter Division
SEREGIN, V. S.	6/29/45	Lieutenant, Flier, 672nd Ground Attack Regiment
SEREDA, I. YE.	5/15/46	Lieutenant, Flight Commander, 178th Guards Fighter Regiment
SEREDA, P. S.	11/23/42	Captain, Squadron Commander, 88th Fighter Regiment
SEREDIN, V. A.	8/19/44	Captain, Navigator, 866th Fighter Regiment
SEREDKIN, YE. A.	7/1/44	Senior Lieutenant, Deputy Squadron Commander, 672nd Ground Attack Regiment
SERZHANTOV, I. YA.	8/24/43	Lieutenant, Flier, 9th Guards Fighter Regiment
SEROV, A. K.	3/2/38	Senior Lieutenant, Commander of a Fighter Detachment
SEROV, V. G.	8/2/44	Senior Lieutenant, Deputy Squadron Commander, 159th Fighter Regiment
SEROV, I. A.	9/14/45	Senior Lieutenant, Squadron Commander, 26th Ground Attack Regiment Air Forces Pacific Ocean Fleet
SEROGODSKIY, V. A.	2/10/42	Lieutenant, Flight Commander, 69th Fighter Regiment
SIBIRIN, S. A.	7/1/44	Captain, Navigator, 18th Guards Fighter Regiment
SIBIRKIN, P. A.	6/27/45	Captain, Squadron Commander, 110th Guards Ground Attack Regiment
SIVOLAPENKO, P. F.	11/5/44	Major, Squadron Navigator, 19th Guards Air Regiment Long-Range Aviation
SIVTSOV, N. S.	9/8/43	Senior Lieutenant, Deputy Squadron Commander, 867th Fighter Regiment

SIGOV, D. I.	12/13/42	Captain, Navigator, 131st Fighter Regiment
SIDNEV, B. A.	5/29/45	General Major of Aviation, Commander, 13th Fighter Corps
SIDORENKO, M. L.	9/28/43	Senior Lieutenant, Flight Commander, 6th Guards Fighter Regiment
SIDORENKO, R. I.	8/2/44	Captain, Squadron Commander, 897th Fighter Regiment
SIDORENKOV V. K.	8/19/44	Senior Lieutenant, Deputy Squadron Commander, 254th Fighter Regiment
SIDORIN, V. N.	2/23/45	Lieutenant, Flight Commander, 807th Ground Attack Regiment
SIDORISHIN, A. P.	5/15/46	Senior Lieutenant, Flight Commander, 226th Guards Bomber Regiment
SIDOROV, I. D.	9/2/43	Captain, Squadron Commander, 92nd Fighter Regiment
SIDOROV, N. G.	8/18/45	Major, Navigator, 329th Fighter Division
SIDOROVICH, A. N.	5/15/46	Lieutenant, Flier, 79th Guards Ground Attack Regiment
SIDYAKIN, V. P.	4/10/45	Lieutenant, Flier, 155th Guards Ground Attack Regiment
SIZOV, V. F.	11/5/42	Senior Lieutenant, Squadron Commander, 146th Fighter Regiment
SILANT'YEV, A. P.	12/17/41	Senior Lieutenant, Deputy Squadron Commander, 160th Fighter Regiment
SIMAKOV, I. N.	3/13/44	Captain, Flight Commander, 109th Air Regiment Long-Range Aviation
SIMANCHUK, V. A.	5/15/46	Junior Lieutenant, Flier, 91st Guards Ground Attack Regiment /568
SIMONENKO, A. F.	8/18/45	Captain, Deputy Squadron Commander, 312th Ground Attack Regiment
SIMONOV, M. V.	12/31/42	Captain, Flight Commander, 2nd Guards Air Regiment Long-Range Aviation

SINITSYN, A. N.	7/22/44	Captain, Squadron Commander, 46th Ground Attack Regiment
SOMOTSUM. V? O?	8/18/45	Junior Lieutenant, Chief of Squadron Communication, 5th Guards Air Regiment Long-Range Aviation
SINCHUK, V. P.	4/13/44	Captain, Deputy Commander, 254th Fighter Regiment
SINCHUKOV, P. S.	4/19/45	Senior Lieutenant, Flight Commander, 75th Guards Ground Attack Regiment
SIRENKO, I. L.	6/29/45	Major, Deputy Commander, 34th Guards Bomber Regiment
SIROTIN, V. N.	4/19/45	Senior Lieutenant, Flight Commander, 75th Guards Ground Attack Regiment
SIROTIN, V. F.	2/23/45	Captain, Deputy Commander for Aerial Gunnery Service, 17th Fighter Regiment
SITKOVSKIY, A. N.	4/13/44	Senior Lieutenant, Deputy Squadron Commander, 15th Fighter Regiment
SITNOV, V. G.	6/20/42	Captain, Deputy Squadron Commander, 21st Air Regiment, Long-Range Aviation
SKLYAROV, I. A.	3/27/42	Lieutenant, Flier, 33rd Air Regiment
SKLYAROV, I. G.	7/1/44	Senior Lieutenant, Squadron Commander, 193rd Fighter Regiment
SKLYAROV, M. G.	7/1/44	Lieutenant Colonel, Commander, 59th Guards Ground Attack Regiment
SKNAREV, A. I.	11/5/44	Major, Navigator, 9th Guards Mine Torpedo Air Regiment Air Forces Northern Fleet
SKOBARIKHIN, V. F.	8/23/39	Senior Lieutenant, Squadron Commander, 22nd Fighter Regiment
SKORNYAKOV, S. A.		Major
SKRYABIN, V. I.	5/1/43	Senior Lieutenant, Deputy Squadron Commander, 40th Guards Fighter Regiment
SKUGAR', V. A.	5/16/44	Captain, Deputy Squadron Commander, 30th Air Observation Regiment Air Forces Black Sea Fleet

SLEPENKOV, YA. Z.	2/22/43	Lieutenant Colonel, Commander, 21st Fighter Regiment, Air Forces Red Banner Baltic Fleet
SLEPNEV, M. T.	4/20/34	Colonel, Commader of a Dirigible Squadron, Main Directorate of the Civil Air Fleet
SLIVKA, A. R.	2/4/44	Senior Lieutenant, Flight Commander, 118th Independent Long-Range Air Observation Squadron
SLIZEN', L. N.	5/15/46	Major, Squadron Commander, 15th Fighter Regiment
SLYUNKIN, V. S.	8/18/45	Lieutenant Colonel, Commander, 189th Guards Ground Attack Regiment
SLYUSAREV, S. V.	2/22/39	Colonel, Deputy Commander of the Air Forces, Leningrad Military District
SMAZNOV, V. V.	2/23/48	Senior Lieutenant, Deputy Commander for Aerial Gunnery Service, 197th Fighter Regiment
SMETANIN, G. A.	2/23/45	Captain, Observation Pilot, 10th Independent Air Observation Regiment
SMIL'SKIY, M. I.	5/1/43	Senior Lieutenant, Squadron Commander, 504th Ground Attack Regiment
SMIRNOV, A. P.	11/5/42	Captain, Squadron Commander, 99th Short-Range Bomber Regiment
SMIRNOV, A. V.	6/29/45	Senior Lieutenant, Deputy Squadron Commander, 6th Guards Independent Ground Attack Regiment
SMIRNOV, B. A.	11/17/39	Major, Inspector of Pilot Technique, 70th Fighter Regiment
SMIRNOV, V. P.	2/8/43	Master Sergeant, Pilot, 629th Fighter Regiment
SMIRNOV, V. A.	4/13/44	Captain, Squadron Navigator, 72nd Air Observation Regiment /569
SMIRNOV, V. V.	3/21/40	Major, Commander, 50th High Speed Bomber Regiment
SMIRNOV, D. I.	2/4/44	Senior Lieutenant, Squadron Commander, 431st Ground Attack Regiment

SMIRNOV, N. F.	5/1/43	Senior Lieutenant, Flight Commander, 366th Bomber Regiment
SMIRNOV, O. N.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 31st Fighter Regiment
SMIRNOVA, M. V.	10/26/44	Captain, Squadron Commander, 46th Guards Night Bomber Regiment
SMORCHKOV, N. I.	2/23/45	Captain, Squadron Commander, 167th Guards Ground Attack Regiment
SMORCHKOV, A. P.		Lieutenant Colonel
SNESAREV, V. S.	5/16/44	Senior Lieutenant, Squadron Commander, 11th Guards Fighter Regiment Air Forces Black Sea Fleet
SOBIN, V. V.	8/19/44	Lieutenant, Squadron Commander, 88th Fighter Regiment
SOBKOVSKIY, G. P.	5/15/46	Senior Lieutenant, Observation Pilot, 16th Independent Long-Range Air Observation Regiment
SOBOLEV, A. P.	8/24/43	Captain, Commander, 2nd Guards Fighter Regiment
SOBOLEV, K. F.	5/15/46	Major, Squadron Commander, 171th Fighter Regiment
SOBOLEV, N. A.	7/1/44	Senior Lieutenant, Flight Commander, 237th Ground Attack Regiment
SOVETSKIY, M. A.	1/22/44	Senior Lieutenant, Flight Navigator, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
SOKOLOV, A. M.	4/12/42	Battalion Commissar, Squadron Military Commissar, 5th Guards Fighter Regiment
SOKOLOV, V. P.	5/15/46	Captain, Squadron Navigator, 47th Guards Independent Air Observation Regiment
SIKOLOV, G. M.	3/21/40	Senior Lieutenant, Flight Commander, 25th Fighter Regiment
SOKOLOV, L. M.	6/27/45	Major, Squadron Commander, 107th Guards Fighter Regiment

SOKOLOV, M. YE.	8/18/45	Major, Squadron Commander, 825th Ground Attack Regiment
SOKOLOV, S. N.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 100th Independent Aerial Spotting Reconnaissance Regiment
SOKOLOV, S. N.	8/19/44	Lieutenant Colonel, Deputy Commander for Political Affairs, 3rd Guards Air Regiment
SOLDATOV, I. A.	6/29/45	Senior Lieutenant, Deputy Squadron Commander, 672nd Ground Attack Regiment
SOLOV'YEV, V. YE.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 6th Guards Independent Ground Attack Regiment
SOLOV'YEV, V. A.	2/23/45	Major, Senior Navigator, 308th Ground Attack Division
SOLOV'YEV, K. V.	10/23/43	Captain, Squadron Commander, 71st Air Regiment, Air Forces Red Banner Baltic Fleet
SOLOV'YEV, M. G.	10/26/44	Lieutenant, Flier, 50th Independent Air Observation Regiment
SOLODILOV, M. A.	6/27/45	Major, Commander, 109th Guards Ground Attack Regiment
SOLOMATIN, A. F.	5/1/43	Senior Lieutenant, Squadron Commander, 296th Fighter Regiment
SOLYANIK, V. F.	5/15/46	Major, Deputy Commander, 20th Guards Air Regiment Long-Range Aviation
SOLYANIKOV, A. D.	8/19/44	Senior Lieutenant, Squadron Commander, 810th Ground Attack Regiment
SOMOV, I. K.	2/4/44	Lieutenant, Deputy Commander, 86th Guards Fighter Regiment
SOMOV, P. A.	4/10/45	Senior Lieutenant, Deputy Squadron Commander, 482nd Fighter Regiment /570
SOROKIN, V. A.	5/15/46	Lieutenant, Flight Commander, 24th Bomber Regiment
SOROKIN, Z. A.	8/19/44	Captain, Navigator, 2nd Guards Fighter Regiment Air Forces, Northern Fleet

SPIRIDENKO, N. K.	2/23/45	Major, Squadron Commander, 172nd Fighter Regiment
SPIRIN, I. T.	6/27/37	Major, Chief of the Aeronavigation Section of the Scientific Research Institute of the Air Force
STARZHINSKIY, I. I.	5/15/46	Lieutenant Colonel, Navigator, 27th Guards Bomber Regiment Long-Range Aviation
STARIKOV, A. K.		Lieutenant Colonel
STARIKOV, D. A.	1/22/44	Senior Lieutenant, Flight Commander, 11th Guards Fighter Regiment Air Forces Black Sea Fleet
STARODUBTSEV, G. S.	6/29/45	Senior Lieutenant, Flight Commander, 166th Guards Ground Attack Regiment
STAROKON', I. I.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 70th Guards Ground Attack Regiment
STAROSTIN, N. F.	2/4/44	Senior Lieutenant, Squadron Navigator, 128th Bomber Regiment
STARCHENKOV, I. S.	2/23/45	Captain, Squadron Commander, 571st Ground Attack Regiment
STARCHIKOV, N. A.	6/27/45	Captain, Squadron Commander, 16th Guards Fighter Regiment
STEL'MAKH, YE. M.		Senior Lieutenant
STEPANOV, A. I.	11/20/41	Sergeant, Pilot, 44th Fighter Division
STEPANOV, YE. N.	8/29/39	Captain, Pilot-Inspector of Pilot Technique, 19th Fighter Regiment
STEPANOV, M. I.	7/1/44	Captain, Navigator, 800th Ground Attack Regiment
STEPANOV, N. N.	6/29/45	Captain, Deputy Commander, 566th Ground Attack Regiment
STEPANOV, F. F.	6/20/42	Captain, Commander of a Detachment of Heavy Bombers of a Long-Range Aviation Air Regiment
STEPIN, K. I.	9/28/43	Captain, Squadron Navigator, 98th Guards Independent Long-Range Air Observation Reg.

STEFANOVSKIY, P. M.		General Major of Aviation
STOL'NIKOV, N. M.	4/7/40	Senior Lieutenant, Pilot, 317th High Speed Bomber Regiment
STOLYAROV, N. I.	2/8/43	Lieutenant, Deputy Squadron Commander, 629th Fighter Regiment
STOROZHAKOV, A. N.	1/16/42	Senior Lieutenant, Deputy Squadron Commander, 154th Fighter Regiment
STRATIYEVSKIY, N. B.	2/23/45	Lieutenant, Chief of Squadron Communications, 96th Guards Air Regiment
STRELETSKIY, P. F.	5/31/44	Captain, Flight Commander, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
STRELKOV, V. D.	6/27/45	Lieutenant, Flight Commander, 82nd Guards Bomber Regiment
STREL'NIKOV, V. P.	3/6/45	Captain, Squadron Commander, 78th Fighter Regiment
STREL'TSOV, V. S.	7/22/44	Captain, Deputy Squadron Commander, 95th Air Regiment Air Forces Northern Fleet
STREL'TSOV, V. F.	2/23/45	Lieutenant Colonel, Navigator, 75th Guards Ground Attack Regiment
STREL'CHENKO, V. I.	2/4/44	Major, Navigator, 948th Ground Attack Regiment
STRILUNOV, V. S.	6/29/45	Lieutenant, Flier, 826th Ground Attack Regiment
STROBYKINYUKHVIT, N. N.	5/15/46	Senior Lieutenant, Flight Commander, 190th Guards Ground Attack Regiment
STROYKOV, N. V.	6/27/45	Senior Lieutenant, Squadron Commander, 213th Fighter Regiment
STROKOV, V. Z.	5/15/46	Lieutenant, Flight Commander, 594th Ground Attack Regiment /571
STRUZHKIN, I. V.	7/21/42	Senior Lieutenant, Deputy Squadron Commander, 512th Dive Bomber Regiment
STUPISHIN, M. P.	10/26/44	Major, Navigator, 198th Ground Attack Regiment

SUBBOTIN, S. P.		Major
SUVIROV, V. I.	4/13/44	Captain, Squadron Commander, 15th Fighter Regiment
SUVOROV, A. YA.	6/27/45	Captain, Navigator, 110th Guards Ground Attack Regiment
SUVOROV, R. M.	5/31/44	Captain, Deputy Squadron Commander, 118th Air Observation Regiment Air Forces Northern Fleet
SUTYAGIN, N. V.		Senior Lieutenant
SUGAK, S. S.	4/13/44	Major, Aircraft Commander, 25th Guards Air Regiment Long-Range Aviation
SURIKOV, EH. I.		Captain
SUGRIN, V. V.	8/18/45	Senior Lieutenant, Flight Commander, 47th Independent Air Observation Regiment
SUDAKOV, V. K.	6/29/45	Captain, Assistant to the Commander, 122nd Guards Bomber Regiment
SUDETS, V. A.	4/28/45	General Colonel of Aviation, Commander, 17th Air Army
SULEV, V. A.	6/29/45	Senior Lieutenant, Flight Commander, 13th Guards Bomber Regiment
SUPONIN, D. V.	2/4/44	Senior Lieutenant, Deputy Squadron Commander, 707th Night Bomber Regiment
SURNEV, N. G.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 866th Fighter Regiment
SUS'KO, YA. YE.	6/29/45	Captain, Squadron Commander, 996th Ground Attack Regiment
SUKHANOV, V. O.	8/18/45	Senior Lieutenant, Squadron Commander, 825th Ground Attack Regiment
SUKHANOV, M. A.	11/5/44	Lieutenant, Squadron Navigator, 12th Guards Air Regiment Air Forces Red Banner Baltic Fleet
SUKHAREV, YE. A.	8/2/44	Lieutenant, Flight Commander, 686th Ground Attack Regiment

SUKHACHEV, V. P.	6/29/45	Senior Lieutenant, Flight Commander, 826th Ground Attack Regiment
SUKHOV, I. S.	2/22/39	Colonel, Inspector-Navigator for the Directorate of the Red Army Air Force
SUKHOV, K. V.	6/27/45	Senior Lieutenant, Squadron Commander, 16th Guards Fighter Regiment
KUKHOV, N. D.	7/1/44	Captain, Deputy Squadron Commander, 44th Guards Night Bomber Regiment
SUKHORUKOV, I. A.	5/15/46	Senior Lieutenant, Navigator, 805th Ground Attack Regiment
SYROMYATNIKOV, B. P.	11/5/44	Lieutenant Colonel, Commander, 9th Mine Torpedo Air Regiment Air Forces Northern Fleet
SYROMYATNIKOV, S. V.	5/1/43	Lieutenant, Deputy Squadron Commander, 875th Fighter Regiment
SYRTLANOVA, M. G.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 46th Guards Night Bomber Regiment
SYRTSOV, D. D.	8/18/45	Major, Deputy Commander, 866th Fighter Regiment
SYTOV, I. N.	9/8/43	Lieutenant, Deputy Squadron Commander, 5th Guards Fighter Regiment
SYCHENKO, P. F.	2/14/43	Captain, Deputy Squadron Commander, 241st Ground Attack Regiment
SYSHCHIKOV, N. S.	9/18/43	Senior Lieutenant, Aircraft Commander, 4th Guards Air Regiment Long-Range Aviation
TAVADZE, D. E.	8/19/44	Captain, Squadron Commander, 190th Ground Attack Regiment
TAGIL'TSEV, V. M.	6/27/45	Senior Lieutenant, Flight Commander, 161st Guards Bomber Regiment /572
TALALIKHIN, V. V.	8/8/41	Junior Lieutenant, Deputy Squadron Commander, 177th Fighter Regiment Air Defense
TANANAYEV, P. N.	5/15/46	Major, Squadron Commander, 20th Guards Bomber Regiment

TARAKANOV, N. N.	4/13/44	Lieutenant, Deputy Squadron Commander, 75th Guards Ground Attack Regiment
TARAKANCHIKOV, N. I.	11/1/43	Senior Lieutenant, Deputy Squadron Commander, 686th Ground Attack Regiment
TARAN, G. A.	11/5/44	Captain, Commander, 3rd Transport Air Regiment Civil Air Fleet
TARANENKO, I. A.	9/2/43	Lieutenant Colonel, Commander, 298th Fighter Regiment
TARASEVICH, K. M.	6/29/45	Captain, Squadron Navigator, 58th Bomber Regiment
TARASOV, A. K.	8/19/44	Captain, Deputy Squadron Commander, 20th Fighter Regiment Air Forces Northern Fleet
TARASOV, D. V.	6/29/45	Senior Lieutenant, Flight Commander, 6th Guards Ground Attack Regiment
TARASOV, D. Z.	6/20/42	Lieutenant, Flight Commander, 21st Air Regiment Long-Range Aviation
TARASOV, P. T.	4/13/44	Major, Deputy Commander for Aerial Gunnery Service,812th Fighter Regiment
TARKHOV, S. F.	12/31/36	Captain, Commander, 107th Fighter Squadron
TARYANIK, G. A.	1/16/42	Battalion Commissar, Squadron Military Commissar, 260th Dive Bomber Regiment
TATARENKO, D. M.	7/24/43	Captain, Deputy Squadron Commander, 3rd Guards Fighter Regiment Air Forces Red Banner Baltic Fleet
TVAURI, G. I.	2/23/45	Senior Lieutenant, Flight Commander, 59th Guards Ground Attack Regiment
TVELENEV, M. S.	2/23/45	Senior Lieutenant, Flight Commander, 9th Guards Fighter Regiment
TELESHEVSKIY, M. Z.	8/24/43	Captain, Deputy Squadron Commander, 148th Fighter Regiment
TEMNOV, V. P.	2/23/45	Captain, Squadron Navigator, 164th Guards Independent Air Observation Regiment
TERENKOV, N. V.	8/19/44	Captain, Squadron Navigator, 34th Guards Bomber Regiment

TERESHKOVA (NIKOLAYEVA), V. V.		Captain, Cosmonaut
TERNOVOY, B. YA.	8/18/45	Major, Squadron Commander, 146th Guards Fighter Regiment Air Defense
TERNOVOY, V. KH.	5/15/46	Lieutenant, Flight Commander, 91st Guards Ground Attack Regiment
TERYAYEV, P. I.	4/19/45	Captain, Squadron Commander, 76th Guards Ground Attack Regiment
TESAKOV, N. F.	3/25/43	Junior Lieutenant, Flier, 749th Air Regiment Long-Range Aviation
TIMOFEYEV, S. P.	6/29/45	Captain, Squadron Navigator, 340th Air Regiment Long-Range Aviation
TIMOFEYEVA (YEGOROVA), A. A.	5/6/65	Senior Reserve Lieutenant, Former Navigator, 805th Ground Attack Regiment
TIMOFEYENKO, I. V.	7/1/44	Senior Lieutenant, Flier, 9th Guards Fighter Regiment
TIMOSHENKO, A. V.	8/18/45	Captain, Squadron Commander, 828th Ground Attack Regiment
TIMOSHENKO, A. I.	6/27/45	Major, Deputy Commander, 106th Guards Fighter Regiment
TITENKOV, K. N.	10/28/41	Captain, Squadron Commander, 11th Fighter Regiment Air Defense
TITOV, G. S.		Major, Cosmonaut /573
TITOV, I. A.	8/18/45	Major, Squadron Commander, 5th Guards Bomber Regiment
TITOV, F. I.	8/19/44	Senior Lieutenant, Deputy Squadron Commander, 2nd Guards Air Regiment Long-Range Aviation
TITOVICH, V. V.	2/23/45	Lieutenant, Flight Commander, 872nd Ground Attack Regiment
TITOVKA, S. A.	7/22/41	Lieutenant, Flight Commander. 154th Fighter Regiment
TITLOV, M. A.		

TIKHOV, A. U.	10/26/44	Senior Lieutenant, Squadron Commander, 874th Ground Attack Regiment
TIKHOMIROV, I. V.	7/22/44	Captain, Squadron Commander, 51st Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
TIKHOMIROV, I. K.	2/14/43	Senior Lieutenant, Chief of Squadron Communications, 24th Bomber Regiment
TIKHOMOLOV, B. YE.	12/31/42	Captain, Flier, 750th Air Regiment Long-Range Aviation
TIKHONOV, B. N.	5/15/46	Senior Lieutenant, Flight Commander, 175th Guards Ground Attack Regiment
TIKHONOV, V. G.	9/16/41	Captain, Squadron Commander, 22nd Long-Range Bomber Regiment
TIKHONOV, V. P.	8/24/43	Junior Lieutenant, Deputy Squadron Commander, 236th Fighter Regiment
TIKHONOV, N. V.	2/4/44	Captain, Squadron Commander, 42nd Fighter Regiment
TIKHONOV, P. I.	8/19/44	Major, Squadron Commander, 2nd Guards Air Regiment Long-Range Aviation
TISHCHENKO, A. T.	5/15/46	Captain, Navigator, 812th Fighter Regiment
TKACHEV, G. YE.	6/29/45	Major, Deputy Navigator, 240th Guards Bomber Regiment Long-Range Aviation
TKACHEV, N. S.	8/19/44	Captain, Squadron Commander, 703rd Ground Attack Regiment
TKACHEVSKIY, YU. M.	2/4/44	Lieutenant, Observation Pilot, 48th Independent Long-Range Air Observation Regiment
TKACHENKO, A. K.	2/23/45	Captain, Squadron Commander, 13th Independent Air Observation Regiment
TKACHENKO, A. G.	5/19/40	Captain, Squadron Commander, 49th Fighter Regiment
TKACHENKO, A. YA.	11/5/44	Major, Squadron Commander, 18th Guards Air Regiment Long-Range Aviation
TKACHENKO, M. N.	4/13/44	Lieutenant, Flight Commander, 210th Ground Attack Regiment

TOBOLENKO, M. N.	7/22/44	Lieutenant, Flight Commander, 15th Independent Air Observation Regiment Air Forces Red Banner Baltic Fleet
TOKAREV, M. S.	12/13/42	Major, Commander, 862nd Fighter Regiment
TOKAREV, N. A.	4/21/40	Lieutenant Colonel, Commander, 2nd Air Regiment Air Forces Black Sea Fleet
TOKARENKO, M. K.	4/10/45	Captain, Navigator, 153rd Guards Fighter Regiment
TOKMAKOV, YE. P.	4/13/44	Captain, Deputy Squadron Commander, 72nd Air Observation Regiment
TOLMACHEV, A. F.	7/24/43	Major, Navigator, 5th Guards Air Regiment Air Forces Black Sea Fleet
TOMAROV, V. A.	2/23/45	Lieutenant, Flight Commander, 872nd Ground Attack Regiment
TOMASHEVSKIY, I. G.	4/13/44	Senior Lieutenant, Flight Navigator, 25th Guards Night Bomber Regiment
TOPALLER, A. S.	5/19/40	Captain, Squadron Commander, 3rd Light Bomber Regiment
TOPOL'SKIY, V. T.	2/10/42	Lieutenant, Squadron Aide, 69th Fighter Regiment
TOPORKOV, YA. N.	5/1/43	Captain, Navigator, 686th Ground Attack Regiment
TOROPOV, A. D.	5/15/46	Captain, Squadron Navigator, 20th Guards Bomber Regiment Long-Range Aviation
TOROPCHIN, N. S.	3/21/40	Major, Commander, 25th Fighter Regiment
TOTMIN, N. YA.	7/22/41	Master Sergeant, Pilot, 158th Fighter Regiment /574
TREGUBOV, N. M.	4/15/44	Captain, Squadron Commander, 721st Fighter Regiment
TRESHCHEV, K. M.	8/2/44	Captain, Pilot-Instructor for Fighter Aviation
TRIFONOV, B. P.	3/21/40	Senior Lieutenant, Flight Commander, 58th High Speed Bomber Regiment

TROITSKIY, G. A.	2/14/43	Major, Squadron Commander, 721st Fighter Regiment Air Defense
TROFIMOV, YE. F.	8/22/44	Captain, Assistant Navigator, 148th Guards Fighter Regiment Air Defense
TROFIMOV, N. L.	6/27/45	Captain, Squadron Commander, 16th Guards Fighter Regiment
TRUBACHENKO, V. P.	8/29/39	Senior Lieutenant, Squadron Commander, 22nd Fighter Regiment
TRUD, A. I.	4/13/44	Lieutenant, Deputy Squadron Commander, 16th Guards Fighter Regiment
TRUSOV, M. T.	3/21/40	Captain, Deputy Squadron Commander, 44th High Speed Bomber Regiment
TRUKHOV, A. I.	8/18/45	Lieutenant, Flight Commander, 103rd Ground Attack Regiment
TRUSHKIN, V. F.	9/14/45	Senior Lieutenant, Squadron Commander, 26th Ground Attack Regiment Air Forces Pacific Ocean Fleet
TUZHILKOV, S. V.	8/18/45	Senior Lieutenant, Navigator, 189th Guards Ground Attack Regiment
TUZOV, M. F.	2/23/45	Major, Squadron Commander, 4th Guards Bomber Regiment
TUYGUNOV, L. N.	11/5/44	Senior Lieutenant, Flight Navigator, 335th Air Regiment Long-Range Aviation
TURBAY, M. P.	8/18/45	Junior Lieutenant, Flier, 783rd Ground Attack Regiment
TURGENEV, F. N.	7/24/42	Captain, Flight Commander, 18th Air Regiment Air Forces Black Sea Fleet
TURENKO, YE. G.	3/21/40	Major, Commander, 7th Fighter Regiment
TURZHANSKIY, B. A.	12/31/36	Brigade Commander, Commander of an Aerial Brigade
TURIKOV, A. M.	5/1/43	Captain, Squadron Navigator, 99th Bomber Regiment
TURKOV, N. YA.	7/22/44	Captain, Squadron Commander, 118th Air Observation Regiment Air Forces Northern Fleet

TURKULI, V. A.	8/18/45	Lieutenant, Flight Commander, 198th Ground Attack Regiment
TUROVTSEV, V. I.	4/12/42	Captain, Squadron Commander, 198th Ground Attack Regiment
TUKHLANOV, A. G.	8/2/44	Lieutenant, Deputy Squadron Commander, 94th Guards Ground Attack Regiment
TUSHEV, I. T.	11/2/44	Captain, Squadron Commander, 191st Fighter Regiment
TYSHEVICH, V. A.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 79th Guards Ground Attack Regiment
TYUKOV, V. M.	4/13/44	Senior Lieutenant, Deputy Squadron Commander, 502nd Ground Attack Regiment
TYULENEV, I. N.	8/24/43	Captain, Squadron Commander, 367th Bomber Regiment
TYULENEV, F. V.	5/1/43	Captain, Navigator, 225th Ground Attack Regiment
TYUL'KIN, M. N.	5/15/46	Major, Navigator, 515th Fighter Regiment
TYURIKOV, S. P.	8/18/45	Major, Navigator, 4th Guards Bomber Regiment
TYURIN, L. F.	8/19/44	Captain, Flight Navigator, 13th Guards Air Regiment Long-Range Aviation
TY''RIN, M. P.	4/7/40	Junior Lieutenant, Flier, 44th Fighter Regiment
UDAL'TSOV, YE. G.	3/6/45	Senior Lieutenant, Deputy Squadron Commander, 47th Ground Attack Regiment Air Forces Red Banner Baltic Fleet
UDACHIN, V. V.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 33rd Guards Ground Attack Regiment /575
UDOVICHENKO, I. M.	4/19/45	Senior Lieutenant, Deputy Squadron Commander, 75th Guards Ground Attack Regiment
ULITIN, I. S.	2/4/44	Lieutenant, Deputy Squadron Commander, 116th Fighter Regiment

UL'YANENKO, N. Z.	8/18/45	Lieutenant, Flight Commander, 46th Guards Night Bomber Regiment
UL'YANOVSKIY, G. G.	4/13/44	Captain, Squadron Commander, 872nd Ground Attack Regiment
URZHUNTSEV, K. I.	2/23/48	Major, Squadron Commander, 171st Guards Air Regiment Long-Range Aviation
USACHEV, F. A.	4/20/45	Lieutenant Colonel, Commander, 15th Independent Air Observation Regiment Air Forces Red Banner Baltic Fleet
USENKO, K. S.	11/5/44	Captain, Squadron Commander, 12th Guards Bomber Regiment Air Forces Red Banner Baltic Fleet
USKOV, V. M.	2/14/43	Captain, Squadron Commander, 234th Fighter Regiment Air Defense
UTIN, A. V.	5/29/45	General Lieutenant of Aviation, Commander, 6th Guards Fighter Corps
UTKIN, YE. I.	6/29/45	Senior Lieutenant, Deputy Squadron Commander, 996th Ground Attack Regiment
USHAKOV, V. G.	11/23/42	Captain, Squadron Commander, 150th Short-Range Bomber Regiment
USHAKOV, S. F.	7/27/43	Lieutenant Colonel, Squadron Navigator, 746th Air Regiment Long-Range Aviation
FADEYEV, A. I.	5/15/46	Major, Squadron Commander, 96th Guards Bomber Regiment
FADEYEV, V. I.	5/24/43	Captain, Squadron Commander, 16th Guards Fighter Regiment
FAK, F. K.	5/5/42	Junior Lieutenant, Chief of Squadron Communications, 150th Short-Range Bomber Regiment
FALIN, V. K.	5/15/46	Captain, Navigator, 237th Ground Attack Regiment
FATEYEV, I. F.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 175th Guards Ground Attack Regiment
FATKIN, S. S.	8/18/45	Senior Lieutenant, Flight Commander, 165th Guards Ground Attack Regiment

FATKULIN, F. M.	11/20/41	Captain, Commander of a Squadron under the Directorate of the 44th Fighter Division
FAT'YANOV, A. YE.	5/7/40	Senior Lieutenant, Deputy Squadron Commander, 5th Independent High Speed Bomber Regiment
FEDORENKO, V. I.	5/24/43	Captain, Navigator, 979th Fighter Regiment
FEDORENKO, N. V.	5/15/46	Lieutenant Colonel, Chief Navigator, 3rd Bomber Corps
FEDORICHEV, N. F.	6/29/45	Lieutenant, Flier, 683rd Ground Attack Regiment
FEDOROV, A. YA.	8/24/43	Senior Lieutenant, Flight Commander, 32nd Guards Fighter Regiment
FEDOROV, A. V.	4/13/44	Captain, Deputy Squadron Commander, 16th Guards Fighter Regiment
FEDOROV, I. V.	10/26/44	Senior Lieutenant, Squadron Commander, 812th Fighter Regiment
FEDOROV, I. G.	11/5/44	Captain, Squadron Commander, 30th Guards Air Regiment Long-Range Aviation
FEDOROV, I. YE.		Colonel
FEDOROV, I. I.	2/4/44	Captain, Squadron Commander, 135th Ground Attack Regiment
FEDOROV, M. T.	10/26/44	Lieutenant, Flight Commander, 431st Ground Attack Regiment
FEDOROV, F. F.	2/8/43	Senior Lieutenant, Deputy Squadron Commander, 629th Fighter Regiment Air Defense /576
FEDORCHUK, I. A.	2/4/44	Lieutenant, Flight Commander, 67th Guards Fighter Regiment
FEDOSEYEV, M. A.	6/6/42	Major, Commander, 247th Fighter Regiment
FEDOTOV, A. A.	5/1/43	Major, Navigator, 169th Fighter Regiment
FEDOTOV, P. F.	6/27/45	Lieutenant Colonel, Commander, 95th Guards Ground Attack Regiment

FEDUTENKO, N. N.	8/18/45	Major, Squadron Commander, 125th Bomber Regiment
FEDYAKOV, I. L.	4/13/44	Senior Lieutenant, Squadron Commander, 503rd Ground Attack Regiment
FEDYAKOV, S. M.	8/19/44	Senior Lieutenant, Deputy Squadron Commander, 872nd Ground Attack Regiment
FEOKTISTOV, A. P.	5/15/46	Lieutenant, Flier, 809th Ground Attack Regiment
FEOKTISTOV, K. P.		Cosmonaut
FEOKTISTOV, S. A.	5/15/46	Captain, Squadron Commander, 568th Ground Attack Regiment
FESENKO, M. I.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 175th Guards Ground Attack Regiment
FIGICHEV, V. A.	11/23/42	Captain, Squadron Commander, 16th Guards Fighter Regiment
FILATOV, G. I.	9/2/43	Senior Lieutenant, Deputy Commander for Aerial Gunnery Service, 146th Fighter Regiment
FILATOV, I. A.	7/1/44	Lieutenant, Flight Commander, 735th Ground Attack Regiment
FILIN, L. A.	8/19/44	Captain, Deputy Squadron Commander, 10th Guards Air Regiment Long-Range Aviation
FILIPPOV, G. F.	2/4/44	Senior Lieutenant, Squadron Commander, 91st Guards Ground Attack Regiment
FILONOV, I. F.	7/1/44	Lieutenant, Deputy Squadron Commander, 672nd Ground Attack Regiment
FIL'CHENKOV, S. YA.	10/26/44	Junior Lieutenant, Crew Navigator, 128th Bomber Regiment
FIRSOV, I. P.	5/21/40	Major, Squadron Commander, 80th Bomber Regiment
FISHCHUK, V. M.	6/27/45	Senior Lieutenant, Flight Navigator, 160th Guards Bomber Regiment
FLEYSHMAN, A. D.	8/24/43	Senior Lieutenant, Deputy Squadron Commander, 4th Fighter Regiment

FOGILEV, V. N.	6/29/45	Lieutenant, Flier, 75th Guards Ground Attack Regiment
FOKIN, A. I.	5/16/44	Major, Squadron Commander, 36th Mine Torpedo Air Regiment Air Forces Black Sea Fleet
FOMENKOV, F. V.	2/22/44	Senior Lieutenant, Squadron Commander, 7th Guards Ground Attack Regiment Air Forces Red Banner Baltic Fleet
FOMIN, YE. A.	10/26/44	Captain, Squadron Commander, 166th Guards Ground Attack Regiment
FOMIN, N. I.	8/19/44	Captain, Flier, 9th Guards Air Regiment Long-Range Aviation
FOMIN, S. S.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 525th Ground Attack Regiment
FOMICHEVA, K. YA.	8/18/45	Captain, Squadron Commander, 125th Guards Bomber Regiment
FOMCHENKOV, K. F.	8/24/43	Captain, Deputy Squadron Commander, 19th Guards Fighter Regiment
FONAREV, I. P.	6/29/45	Senior Lieutenant, Flight Commander, 74th Guards Ground Attack Regiment
FRANTSEV, YE. I.	8/19/44	Senior Lieutenant, Squadron Pilot, 9th Guards Mine Torpedo Air Regiment Air Forces Northern Fleet
FRANCHUK, K. YA.	8/18/45	Captain, Squadron Navigator, 650th Bomber Regiment
FROLOV, A. P.	5/6/65	Reserve Captain, Former Deputy Squadron Commander, 659th Fighter Regiment
FROLOV, A. F.	12/13/42	Senior Lieutenant, Flight Navigator, 5th Guards Air Regiment Long-Range Aviation /577
FROLOV, I. T.	8/18/45	Senior Lieutenant, Flight Commander, 166th Guards Ground Attack Regiment
FROLOV, M. A.	8/18/45	Lieutenant, Squadron Commander, 657th Ground Attack Regiment
FROLOVSKIY, S. A.	8/7/43	Senior Lieutenant, Aircraft Commander, 1st Air Regiment Civil Air Fleet

FRUNZE, T. M.	3/16/42	Lieutenant, Flier, 161st Fighter Regiment
FURS, P. M.	8/19/44	Guards Captain, Squadron Commander, 8th Guards Air Regiment Long-Range Aviation
FUTKULIN, A. A.	4/10/45	Senior Lieutenant, Deputy Squadron Commander, 140th Guards Ground Attack Regiment
FUFACHEV, V. F.	6/29/45	Lieutenant, Flier, 565th Ground Attack Regiment
KHALIULIN, M. KH.	8/18/45	Captain, Squadron Commander, 783rd Ground Attack Regiment
KHAL'ZEV, A. I.	8/19/44	Senior Lieutenant, Deputy Squadron Commander, 63rd Night Bomber Regiment
KHAL'ZOV, V. S.	5/24/43	Senior Sergeant, Flier, 586th Ground Attack Regiment
KHARITONOV, V. N.	2/10/43	Senior Lieutenant, Flight Commander, 123rd Fighter Regiment Air Defense
KHARITONOV, V. M.	2/23/45	Senior Lieutenant, Flight Commander, 10th Independent Air Observation Regiment
KHARITONOV, N. V.	5/1/43	Senior Lieutenant, Deputy Squadron Commander, 520th Fighter Regiment
KHARITONOV, N. N.	8/19/44	Senior Lieutenant, Flight Commander, 2nd Guards Air Regiment Long-Range Aviation
KHARITONOV, P. T.	7/8/41	Junior Lieutenant, Flier, 158th Fighter Regiment
KHARITOSHKIN, A. N.	5/15/46	Senior Lieutenant, Flight Commander, 23rd Guards Night Bomber Regiment
KHARLAMOV, V. M.	2/7/40	Captain, Crew Navigator, 40th Bomber Regiment Air Forces Black Sea Fleet
KHARLAMOV, G. I.	8/18/45	Major, Flier-Inspector for the Combat Training Directorate of the Air Force
KHARLAMOV, S. I.	2/23/45	Senior Lieutenant, Squadron Commander, 163rd Guards Fighter Regiment
KHARLAN, I. F.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 103rd Ground Attack Regiment

KHARCHENKO, S. A.	6/20/42	Senior Lieutenant, Flight Commander, 752nd Air Regiment Long-Range Aviation
KHARCHISTOV, V. V.	6/27/45	Captain, Squadron Commander, 153rd Guards Fighter Regiment
KHASSIN, V. YA.	5/1/43	Captain, Squadron Commander, 271st Fighter Regiment
KHVOSTUNOV, A. G.	5/5/42	Junior Lieutenant, Flight Commander, 150th Short-Range Bomber Regiment
KHVOYA, N. F.	6/27/45	Lieutenant Colonel, Commander, 94th Guards Ground Attack Regiment
KHIMICH, F. V.	10/26/44	Major, Deputy Commander for Aerial Gunnery Service, 282nd Fighter Division
KHIMUSHIN, N. F.	2/4/44	Lieutenant, Flier, 106th Fighter Regiment
KHITALISHVILI, Z. S.	4/13/44	Captain, Squadron Commander, 232nd Ground Attack Regiment
KHITRIN, V. A.	10/22/41	Senior Lieutenant, Flight Commander, 29th Fighter Regiment
KHLOBYSTOV, A. S.	6/6/42	Senior Lieutenant, Deputy Squadron Commander, 20th Guards Fighter Regiment
KHLUD, B. A.	9/2/43	Captain, Squadron Commander, 146th Fighter Regiment
KHOVANSKIY, I. A.	7/4/37	Lieutenant, Flight Commander, 41st Squadron /578
KHOLODNYY, G. S.	5/15/46	Captain, Flier, 157th Fighter Regiment
KHOLODOV, I. M.	3/4/42	Senior Lieutenant, Deputy Squadron Commander, 28th Fighter Regiment Air Defense
KHOL'ZUNOV, A. I.	5/1/43	Lieutenant, Deputy Squadron Commander, 32nd Guards Fighter Regiment
KHOL'ZUNOV, V. S.	6/27/37	Brigade Commander, Commander of the 49th Air Brigade
KHOROKHONOV, N. D.	6/27/45	Junior Lieutenant, Flight Commander, 143rd Guards Ground Attack Regiment

KHOROSHILOV, V. A.	3/21/40	Senior Lieutenant, Flight Commander, 48th High Speed Bomber Regiment
KHOKHLACHEV, V. F.	4/13/44	Captain, Squadron Commander, 79th Guards Ground Attack Regiment
KHOKHLOV, P. I.	8/13/41	Captain, Navigator, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
KHRAMOV, N. I.	2/23/48	Lieutenant Colonel, Flier-Inspector
KHRAPOV, P. I.	5/15/46	Major, Squadron Commander, 16th Guards Bomber Regiment
KHRUSTALEV, P. I.	8/18/45	Senior Lieutenant, Crew Navigator, 99th Guards Independent Air Observation Regiment
KHRUSTALEV, P. P.	7/27/43	Captain, Squadron Navigator, 8th Guards Air Regiment Long-Range Aviation
KHRUSHCHEV, I. M.	3/13/44	Senior Lieutenant, Flight Commander, 243rd Guards Air Regiment Long-Range Aviation
KHRYUKIN, C. K.	2/23/45	Captain, Squadron Commander, 173rd Guards Ground Attack Regiment
KHRYAYEV, V. I.	10/23/42	Senior Lieutenant, Deputy Squadron Commander, 9th Fighter Regiment Air Forces Black Sea Fleet
KHUDOV, P. D.	9/8/43	Junior Lieutenant, Deputy Squadron Commander, 867th Fighter Regiment
KHUDYAKOV, I. S.	4/7/40	Senior Lieutenant, Aide, 31st High Speed Bomber Regiment
KHUDYAKOV, N. V.	6/27/45	Captain, Deputy Commander for Aerial Gunnery Service, 32nd Fighter Regiment
KHUDYAKOVA, A. F.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 46th Night Bomber Regiment
KHUKHRI', A. V.	8/18/45	Captain, Squadron Commander, 593rd Ground Attack Regiment
TSAPOV, I. I.	7/22/44	Captain, Squadron Commander, 3rd Guards Fighter Regiment Air Forces Red Banner Baltic Fleet

TSAREV, A. V.	5/15/46	Captain, Squadron Commander, 452nd Bomber Regiment
TSAREGORODSKIY, A. A.	5/15/46	Captain, Squadron Navigator, 96th Guards Bomber Regiment
TSISEL'SKIY, M. P.	3/6/45	Captain, Understudy Navigator, 12th Guards Glider Regiment Air Forces Red Banner Baltic Fleet
TSOKOLAYEV, G. D.	6/14/42	Senior Lieutenant, Deputy Squadron Commander, 4th Guards Fighter Regiment, Air Forces Red Banner Baltic Fleet
TSURTSUMIYA, A. P.	2/22/44	Major, Squadron Commander, 40th Bomber Regiment Air Forces Black Sea Fleet
TSYGANOV, YE. T.	1/22/44	Captain, Squadron Commander, 4th Guards Fighter Regiment Air Forces Red Banner Baltic Fleet
TSYKIN, M. D.	8/18/45	Lieutenant, Flight Commander, 31st Fighter Regiment
TSYPLUKHIN, N. D.	10/26/44	Captain, Squadron Commander, 70th Ground Attack Regiment
CHAGOVETS, G. I.	11/5/44	Lieutenant, Flier, 15th Independent Air Observation Regiment Air Forces Red Banner Baltic Fleet
CHALOV, YE. M.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 622nd Ground Attack Regiment /579
CHAPCHAKHOV, [illegible]. S.	7/21/42	Senior Political Officer, Squadron Military Commissar, 38th Fighter Regimert
CHASNYK, N. L.	8/22/44	Senior Lieutenant, Deputy Squadron Commander, 148th Guards Fighter Regiment Air Defense
CHVANOV, V. T.	7/22/44	Senior Lieutenant, Flight Navigator, 1st Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
CHEKIN, B. S.	4/19/45	Lieutenant, Deputy Squadron Commander, 566th Ground Attack Regiment
CHELPANOV, V. I.	2/14/43	Lieutenant, Deputy Squadron Commander, 24th Short-Range Bomber Regiment

CHEPELYUK, S. G.	10/26/44	Junior Lieutenant, Deputy Squadron Commander, 144th Guards Ground Attack Regiment
CHEPIGA, YU. YA.	6/29/45	Major, Navigator, 952nd Ground Attack Regiment
CHEPINOGA, P. I.	10/26/44	Captain, Squadron Commander, 508th Fighter Regiment
CHERVYAKOV, V. I.	2/4/44	Junior Lieutenant, Flier, 48th Guards Independent Long-Range Observation Regiment
CHEREVATENKO, A. T.	2/10/42	Senior Lieutenant, Flight Commander, 69th Fighter Regiment
CHEREVICHNYY, I. I.		
CHEREZOV, A. S.	4/13/44	Lieutenant, Flight Commander, 78th Guards Fighter Regiment
CHEREPNEV, S. M.	9/18/43	Captain, Squadron Navigator, 4th Guards Air Regiment Long-Range Aviation
CHERKASHIN, G. G.	6/29/45	Lieutenant, Flight Commander, 672nd Ground Attack Regiment
CHERNENKO, V. I.	8/19/44	Senior Lieutenant, Flight Commander, 3rd Guards Fighter Regiment Air Forces Red Banner Baltic Fleet
CHERNETSOV, G. U.	4/10/45	Lieutenant Colonel, Commander, 155th Guards Ground Attack Regiment
CHERNIENKO, G. G.	7/24/43	Major, Squadron Commander, 5th Guards Air Regiment Air Forces Black Sea Fleet
CHERNOBAY, A. P.	2/22/43	Lieutenant, Deputy Squadron Commander, 875th Fighter Regiment
CHERNOV, A. F.		
CHERNOV, G. G.	4/13/44	Captain, Navigator, 232nd Ground Attack Regiment
CHERNOVSKIY, S. A.	6/29/45	Captain, Squadron Commander, 22nd Guards Bomber Regiment
CHERNOPYATOV, G. V.	5/15/46	Major, Deputy Commander, 26th Guards Bomber Regiment

CHERNYKH, I. S.	1/16/42	Junior Lieutenant, Flier, 125th Bomber Regiment
CHERNYKH, S. A.	12/31/36	Lieutenant, Flight Commander, 61st Fighter Squadron
CHERNYSH, P. P.	6/27/45	Senior Lieutenant, Flight Commander, 81st Guards Bomber Regiment
CHERNYSHEV, A. P.	1/22/44	Captain, Squadron Commander, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
CHERNYSHOV, A. F.	8/18/45	Senior Lieutenant, Squadron Commander, 569th Ground Attack Regiment
CHESNOKOV, L. I.	3/24/45	Captain, Squadron Commander, 207th Independent Long-Range Air Observation Regiment
CHESNOKOV, F. S.	6/24/43	Junior Lieutenant, Flight Commander, 367th Bomber Regiment
CHECHELASHVILI, O. G.	6/27/45	Captain, Squadron Commander, 141st Guards Ground Attack Regiment
CHECHENEV, M. S.	5/15/46	Captain, Squadron Commander, 451st Ground Attack Regiment
CHECHNEVA, M. P.	5/15/46	Captain, Squadron Commander, 46th Guards Night Bomber Regiment
CHIBISOV, YU. V.	10/26	Senior Lieutenant, Deputy Squadron Commander, 15th Guards Ground Attack Regiment /580
CHIRKOV, A. V.	2/4/44	Major, Deputy Commander for Aerial Gunnery Service, 29th Guards Fighter Regiment
CHISLOV, A. M.	8/24/43	Captain, Squadron Commander, 63rd Guards Fighter Regiment
CHISTOV, B. P.	3/25/43	Lieutenant, Flier, 749th Air Regiment Long-Range Aviation
CHISTYAKOV, V. M.	6/20/42	Captain, Detachment Navigator, 1st Heavy Bomber Regiment Long-Range Aviation
CHISTYAKOV, V. F.	8/29/39	Senior Lieutenant, Squadron Commander, 22nd Fighter Regiment

CHISTYAKOV, YE. M.	11/20/41	Junior Lieutenant, Deputy Squadron Commander, 92nd Fighter Regiment
CHKALOV, V. P.	7/24/36	Brigade Commander, Test Pilot
CHOCHIYEV, V. S.	11/1/43	Senior Lieutenant, Squadron Commander, 807th Ground Attack Regiment
CHUBUKOV, F. M.	8/19/44	Captain, Squadron Commander, 29th Guards Fighter Regiment
CHUGUNOV, V. K.	10/26/44	Captain, Squadron Commander, 897th Fighter Regiment
CHUVIN, N. I.	4/13/44	Senior Lieutenant, Deputy Squadron Commander, 2nd Guards Ground Attack Regiment
CHUDBIN, L. S.	4/10/45	Senior Lieutenant, Deputy Squadron Commander, 153rd Guards Fighter Regiment
CHULKOV, A. P.	12/31/42	Major, Deputy Squadron Commander for Political Affairs, 751st Air Regiment Long-Range Aviation
CHULKOV, I. D.	2/24/42	Senior Lieutenant, Flight Commander, 41st Fighter Regiment
CHUMACHENKO, D. V.	6/29/45	Lieutenant Colonel, Deputy Commander, 240th Guards Bomber Regiment Long-Range Aviation
CHUPIKOV, P. F.	8/19/44	Colonel, Commander, 19th Fighter Regiment
CHURILIN, A. P.	8/18/45	Major, Squadron Commander, 611th Fighter Regiment
CHURILIN, A. P.	3/13/44	Major, Aircraft Commander, 25th Guards Air Regiment Long-Range Aviation
CHUKHAREV, A. I.	6/29/45	Captain, Squadron Commander, 996th Ground Attack Regiment
CHUCHVAGA, I. I.	8/24/43	Captain, Squadron Commander, 866th Fighter Regiment
SHABAN, K. A.	8/2/44	Senior Lieutenant, Flier, 809th Ground Attack Regiment
SHABEL'NIKOV, I. S.	2/23/45	Senior Lieutenant, Flight Commander, 6th Independent Guards Ground Attack Regiment

SHAVURIN, P. I.	2/14/43	Senior Lieutenant, Deputy Squadron Commander, 722nd Fighter Regiment Air Defense
SHADRIN, G. A.	6/29/45	Major, Squadron Commander, 117th Guards Fighter Regiment
HSAKURIN, P. S.	6/27/45	Captain Squadron Commander, 155th Guards Ground Attack Regiment
SHALIMOV, V. YE.	2/10/43	Major, Commander, 15th Guards Ground Attack Regiment
SHALIMOV, V. F.	2/23/45	Captain, Deputy Chief of Headquarters for Reconnaissance and Aerophoto Service, 13th Air Observation Regiment
SHAMANOV, I. G.	1/22/44	Captain, Flight Commander, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
SHAMANSKIY, A. F.	4/10/45	Senior Lieutenant, Squadron Commander, 156th Guards Fighter Regiment
SHAMENKOV, I. F.	5/15/46	Senior Lieutenant, Flight Commander, 150th Guards Fighter Regiment
SHAMSHURIN, V. G.	2/8/43	Junior Lieutenant, Pilot, 7th Guards Ground Attack Regiment
SHANDULA, V. N.	6/27/45	Captain, Deputy Squadron Commander, 162nd Guards Bomber Regiment /581
SHAPIRO, V. YE.	5/15/46	Senior Lieutenant, Flight Commander, 31st Guards Fighter Regiment
SHAPKIN, N. V.	7/22/44	Lieutenant, Flier, 15th Independent Air Observation Regiment Air Forces Red Banner Baltic Fleet
SHAPOVALOV, A. T.	7/1/44	Master Sergeant, Chief of Squadron Communications, 36th Guards Bomber Regiment
SHAPOSHNIKOV, A. I.	3/29/42	Captain, Deputy Squadron Commander, 751st Long-Range Bomber Regiment
SHARAPA, V. YE.	3/21/40	Senior Lieutenant, Squadron Navigator, 44th High Speed Bomber Regiment
SHARDAKOV, I. A.	9/8/43	Senior Lieutenant, Deputy Squadron Commander, 5th Guards Fighter Regiment

SHARENKO, V. D.	4/13/44	Captain, Squadron Commander, 100th Guards Fighter Regiment
SHARKOV, V. I.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 218th Ground Attack Regiment
SHAROV, A. M.	8/18/45	Lieutenant, Flight Commander, 190th Ground Attack Regiment
SHAROV, V. V.	3/21/40	Captain, Squadron Commander, 48th High Speed Bomber Regiment
SHAROV, D. M.	11/5/44	Major, Chief of Headquarters, 13th Fighter Regiment Air Forces Red Banner Baltic Fleet
SHAROV, P. S.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 723rd Ground Attack Regiment
SHARONOV, M. F.	2/13/44	Senior Lieutenant, Squadron Commander, 191st Fighter Regiment
SHATAYEV, N. I.	5/15/46	Major, Deputy Commander, 3rd Guards Bomber Regiment
SHATALIN, I. I.	8/18/45	Senior Lieutenant, Squadron Commander, 103rd Ground Attack Regiment
SHATILO, M. F.	6/29/45	Senior Lieutenant, Flight Commander, 76th Guards Ground Attack Regiment
SHATIN, G. N.	5/15/46	Junior Lieutenant, Flight Commander, 175th Guards Ground Attack Regiment
SHATOV, M. G.	2/23/45	Lieutenant, Fligher, 7th Guards Ground Attack Regiment
SHATROV, F. A.	3/13/44	Captain, Aircraft Commander, 25th Guards Air Regiment Long-Range Aviation
SHAKHT, E. G.	12/31/36	Major, Commander of a Special Squadron
SHASHLOV, YA. A.	5/15/46	Major, Deputy Commander, 18th Guards Bomber Regiment Long-Range Aviation
SHVETS, S. I.	9/18/43	Major, Squadron Commander, 16th Guards Air Regiment Long-Range Aviation
SHEBANOV, F. A.		Senior Lieutenant

SHEVELEV, A. A.	11/5/44	Captain, Deputy Squadron Commander, 30th Guards Air Regiment Long-Range Aviation
SHEVELEV, M. I.	6/27/37	Chief of Polar Aviation
SHEVELEV, P. F.	2/4/44	Captain, Squadron Commander, 67th Guards Fighter Regiment
SHEVELEV, S. N.	5/1/43	Captain, Navigator, 249th Fighter Regiment
SHEVERDYAYEV, N. P.	8/18/45	Junior Lieutenant, Flier, 828th Ground Attack Regiment
SHEVKUNOV, A. K.	7/1/44	Lieutenant, Flight Commander, 449th Bomber Regiment
SHEVTSOV, A. G.	9/8/43	Captain, Navigator, 171st Fighter Regiment
SHEVTSOV, P. F.	10/22/37	Lieutenant, Flier, 107th Fighter Squadron
SHEVCHENKO, P. G.	2/23/45	Lieutenant, Flight Commander, 566th Ground Attack Regiment
SHEVCHUK, B. M.	6/27/45	Major, Deputy Commander, 152nd Guards Fighter Regiment
SHEVYRIN, V. M.	6/29/45	Senior Lieutenant, Flight Commander, 164th Fighter Regiment
SHEIN, P. S.	1/22/44	Junior Lieutenant, Aircraft Navigator, 118th Air Observation Regiment Air Forces Northern Fleet /582
SHEMENDYUK, P. S.	8/24/43	Senior Lieutenant, Deputy Squadron Commander, 157th Fighter Regiment
SHESTAKOV, L. L.	2/10/42	Major, Commander, 69th Fighter Regiment
SHESTERNIN, B. I.	11/5/44	Senior Lieutenant, Flight Navigator, 20th Guards Air Regiment Long-Range Aviation
SHEKHIREV, B. A.	8/18/45	Junior Lieutenant, Flier, 783rd Ground Attack Regiment
SHIBAYEV, A. V.	8/18/45	Major, Deputy Commander, 622nd Ground Attack Regiment
SHIBANOV, V. I	11/1/43	Lieutenant, Flight Commander, 25th Guards Night Bomber Regiment
SHILOV, M. I.	2/10/42	Lieutenant, Flier, 69th Fighter Regiment

SHIMKO, G. L.	5/15/46	Lieutenant, Flier, 91st Guards Ground Attack Regiment
SHINKARENKO, F. I.	4/7/40	Senior Lieutenant, Squadron Commander, 7th Fighter Regiment
SHIPILOV, V. A.	6/29/45	Lieutenant, Aircraft Commander for a Special Transport Squadron
SHIPITSYN, M. D.	8/18/45	Lieutenant, Flight Commander, 43rd Guards Ground Attack Regiment
SHIPOV, A. P.	11/5/44	Captain, Navigator, 20th Air Regiment Air Forces Northern Fleet
SHIROKIKH, V. I.	5/15/46	Lieutenant, Flier, 91st Guards Ground Attack Regiment
SHIRYAYEV, V. A.	2/8/43	Captain, Squadron Commander, 806th Ground Attack Regiment
SHISHKAN', I. M.	1/28/43	Senior Lieutenant, Deputy Squadron Commander, 158th Fighter Regiment
SHISHKIN, A. P.	9/28/43	Captain, Deputy Squadron Commander, 32nd Guards Fighter Regiment
SHISHKIN, V. I.	3/27/42	Captain, Squadron Commander, 43rd Fighter Regiment
SHISHKIN, YA. V.	6/27/45	Captain, Squadron Commander, 32nd Fighter Regiment
SHISHKOV, M. F.	11/5/44	Lieutenant, Flight Commander, 1st Guards Mine Torpedo Air Regiment Air Forces Red Banner Baltic Fleet
SHISHOV, V. A.	11/23/42	Captain, Squadron Commander, 233rd Fighter Regiment
SHISHOV, L. M.	4/13/44	Lieutenant, Deputy Squadron Commander, 61st Ground Attack Regiment
SHIYANOV, G. M.		
SHKULEPOV, A. P.	7/1/44	Major, Commander, 949th Ground Attack Regiment
SHKARUBA, K. F.	8/19/44	Captain, Deputy Squadron Commander, 9th Guards Mine Torpedo Air Regiment Air Forces, Northern Fleet

SHLEPOV, V. P.	9/28/43	Senior Lieutenant, Squadron Commander, 41st Guards Fighter Regiment
SHMAKOV, A. I.	8/18/45	Lieutenant, Flier, 783rd Ground Attack Regiment
SHMELEV, I. V.	8/24/43	Major, Squadron Commander, 4th Fighter Regiment
SHMELEV, N. A.	8/18/45	Senior Lieutenant, Deputy Squadron Commander, 707th Ground Attack Regiment
SHMEL'KOV, N. I.	12/31/36	Colonel, Detachment Commander, 65th Fighter Squadron
SHMIGOL, P. L.	10/26/44	Senior Lieutenant, Deputy Squadron Commander, 92nd Guards Ground Attack Regiment
SHMYRIN, F. S.	5/15/46	Junior Lieutenant, Flight Commander, 175th Guards Ground Attack Regiment
SHOKUROV, A. A.	6/27/45	Senior Lieutenant, Deputy Squadron Commander, 156th Guards Fighter Regiment
SHORNIKOV, A. S.	6/20/44	Major, Aircraft Commander, 1st Transport Air Division
SHPIL'KOV, G. A.	6/29/45	Junior Lieutenant, Flier, 74th Guards Ground Attack Regiment
SHPUNYAKOV, S. N.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 402nd Fighter Regiment /583
SHTANEV, YA. I.	2/23/48	Major, Deputy Chief of Headquarters for Reconnaissance and Aerophoto Service, 121st Guards Air Regiment Long-Range Aviation
SHTEPENKO, A. P.	6/20/42	Major, Squadron Navigator, 746th Air Regiment Long-Range Aviation
SHTRYAKIN, M. I.	8/18/45	Lieutenant, Flight Commander, 810th Ground Attack Regiment
SHUL'ZHENKO, L. V.		Captain
SHUMEYKO, A. A.	8/2/44	Major, Deputy Commander, 12th Bomber Regiment

SHUMILOV, I. P.	3/4/42	Lieutenant, Flier, 16th Fighter Regiment Air Defense
SHUMSKIY, K. M.	8/2/44	Lieutenant Colonel, Commander, 93rd Guards Ground Attack Regiment
SHUPIK, G. S.	8/18/45	Lieutenant, Deputy Squadron Commander, 43rd Guards Ground Attack Regiment
SHURGAYA, SH. I.	5/15/46	Lieutenant, Flight Commander, 175th Guards Ground Attack Regiment
SHUTT, N. K.	2/4/44	Senior Lieutenant, Deputy Commander for Aerial Gunnery Service, 270th Fighter Regiment
SHCHAPOV, B. D.	8/19/44	Junior Lieutenant, Flier, 144th Guards Ground Attack Regiment
SHCHEGLOV, S. S.	5/15/46	Captain, Squadron Navigator, 128th Bomber Regiment
SHCHEGOLEV, V. G.	8/18/45	Captain, Squadron Commander, 162nd Fighter Regiment
SHCHELKUNOV, V. I.	9/16/41	Major, Deputy Commander, 200th Bomber Regiment Long-Range Aviation
SHCHERBAKOV, V. I.	3/6/45	Senior Lieutenant, Flight Commander, 11th Guards Fighter Regiment Air Forces Black Sea Fleet
SHCHERBAKOV, I. I.	5/15/46	Captain, Squadron Commander, 176th Guards Fighter Regiment
SHCHERBAKOV, S. V.	5/15/46	Major, Navigator, 15th Guards Air Regiment Long-Range Aviation
SHCHERBINA, N. G.	8/22/44	Captain, Navigator, 26th Guards Fighter Regiment
SHCHERBINA, N. S.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 36th Guards Bomber Regiment
SHCHUKIN, L. K.		Captain
YUDIN, A. S.	9/28/43	Captain, Squadron Commander, 183rd Fighter Regiment
YUZHILIN, A. G.	8/19/44	Captain, Flight Commander, 9th Guards Air Regiment Long-Range Aviation

YUL'YEV, A. N.	5/15/46	Junior Lieutenant, Flier, 43rd Guards Ground Attack Regiment
YUMASHEV, A. B.	9/1/37	Colonel, Commander of a Heavy Air Squadron
YURKIN, N. I.	9/28/43	Senior Lieutenant, Flight Commander, 98th Guards Independent Long-Range Air Observation Regiment
YURCHENKO, P. A.	9/18/43	Captain, Deputy Squadron Commander, 9th Guards Air Regiment Long-Range Aviation
YURCHENKO, F. S.	2/10/43	Major, Squadron Navigator, 44th High Speed Bomber Regiment
YUR'YEV, L. V.	4/13/44	Senior Lieutenant, Observation Pilot, 98th Independent Long-Range Air Observation Regiment
YUFEROV, N. P.	6/29/45	Senior Lieutenant, Flight Commander, 96th Independent Aerial Spotting Reconnaissance Regiment
YUKHOTNIKOV, N. A.	8/18/45	Major, Senior Navigator, 214th Ground Attack Division
YUSHIN, S. V.	6/29/45	Lieutenant, Deputy Squadron Commander, 637th Ground Attack Regiment
EMIROV, V. A.	12/13/42	Captain, Commander, 926th Fighter Regiment
YAKIMENKO, A. D.	8/29/39	Master Sergeant, Squadron Navigator, 22nd Fighter Regiment
YAKIMOV, P. N.	6/20/44	Captain, Crew Navigator, 1st Air Transport Division /584
YAKOVENKO, L. I.	4/7/40	Battalion Commissar, Military Commissar, 68th Fighter Regiment
YAKOVITSKIY, A. A.	4/10/45	Major, Deputy Commander, 140th Guards Ground Attack Regiment
YAKOVLEV, A. I.	6/29/45	Senior Lieutenant, Deputy Squadron Commander, 565th Ground Attack Regiment
YAKOVLEV, A. N.	5/20/40	Lieutenant, Flight Commander of the 1st Air Detachment of the Civil Air Fleet

YAKOVLEV, A. A.	5/15/46	Senior Lieutenant, Deputy Squadron Commander, 208th Ground Attack Squadron
YAKOVLEV, YE. N.	8/18/45	Major, Squadron Commander, 19th Guards Air Regiment Long-Range Aviation
YAKOVLEV, N. YA.	6/27/45	Senior Lieutenant, Squadron Commander, 140th Guards Ground Attack Regiment
YAKUBOV, I. F.	2/22/43	Lieutenant, Deputy Squadron Commander, 653rd Fighter Regiment
YAKUBOVSKIY, P. G.	10/26/44	Captain, Deputy Squadron Commander, 31st Fighter Regiment
YAKUNENKO, A. I.	2/23/45	Lieutenant, Deputy Squadron Commander, 198th Ground Attack Regiment
YAKURNOV, I. F.	10/26/44	Senior Lieutenant, Squadron Commander, 92nd Guards Ground Attack Regiment
YALOVOY, I. P.	5/15/46	Major, Squadron Commander, 745th Bomber Regiment
YALOVOY, F. S.	11/5/44	Major, Navigator, 15th Guards Air Regiment Long-Range Aviation
YANITSKIY, V. I.	8/12/42	Lieutenant, Deputy Squadron Commander, 52nd Short-Range Bomber Regiment
YANKO, M. YE.	9/14/45	Junior Lieutenant, Flight Commander, 37th Ground Attack Regiment Air Forces Pacific Ocean Fleet
YANKOVSKIY, S. G.	2/23/45	Senior Lieutenant, Deputy Squadron Commander, 6th Guards Independent Ground Attack Regiment
YANOVSKIY, I. I.	11/5/44	Senior Lieutenant, Squadron Navigator, 8th Guards Air Regiment Long-Range Aviation
YAREMENKO, YE. M.	6/27/45	Captain, Deputy Squadron Commander, 5th Guards Fighter Regiment
YAROVOY, F. S.	11/23/42	Lieutenant, Squadron Commander, 131st Fighter Regiment
YARTSEV, V. YE.		Senior Lieutenant
YAKHNOV, G. M.	8/22/44	Major, Deputy Commander, 33rd Fighter Regiment Air Defense

YATSKOVSKIY, S. V.	8/18/45	Captain, Deputy Squadron Commander, 164th Guards Independent Air Observation Regiment
YASHIN, V. N.	10/26/44	Captain, Squadron Commander, 133rd Fighter Regiment
YASHCHUK, R. D.	2/4/44	Senior Lieutenant, Crew Navigator, 47th Guards Long-Range Reconnaissance Regiment

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2. Aviators -- Bearers of the Order of Glory First Step /585

ASEYEV, M. I.	6/29/45	Senior Sergeant, Aerial Gunner, 74th Guards Ground Attack Regiment
ASHIN, A. S.	5/15/46	Senior Sergeant, Aerial Gunner, Radio Operator, 10th Independent Air Observation Regiment
BEREZA, G. P.	4/19/45	Master Sergeant, Aerial Gunner, 74th Guards Ground Attack Regiment
BLAGOV, P. S.	5/15/46	Master Sergeant, Aerial Gunner, 75th Guards Ground Attack Regiment
BRAIN, N. V.	5/15/46	Sergeant, Aerial Radio Gunner, 34th Guards Bomber Regiment
VARUSHIN, I. D.	6/29/45	Senior Sergeant, Aerial Gunner, 953rd Ground Attack Regiment
VASIL'YEV, A. A.	5/15/46	Senior Sergeant, Aerial Radio Gunner, 511th Independent Air Observation Regiment
VLASOV, P. F.	2/23/48	Junior Lieutenant, Chief of Squadron Communications, 28th Guards Bomber Regiment
GERASIMOV, M. K.	5/15/46	Master Sergeant, Aerial Gunner, 9th Guards Ground Attack Regiment
GRIGORENKO, N. A.	6/27/45	Senior Sergeant, Aerial Radio Gunner, 36th Guards Bomber Regiment
DEM'YANOV, I. N.	12/20/51	Master Sergeant, Flier, 92nd Guards Ground Attack Regiment
DRACHENKO, I. G., Hero of the Soviet Union	11/26/58	Lieutenant, Flier, 140th Guards Ground Attack Regiment
DUZ', I. F.	5/15/46	Master Sergeant, Aerial Gunner, 74th Guards Ground Attack Regiment
ZHYRKINA, N. A.	2/23/48	Master Sergeant, Aerial Radio Gunner, 99th Guards Independent Air Observation Regiment
IL'CHENKO, I. P.	2/23/48	Master Sergeant, Aerial Gunner, 174th Guards Ground Attack Regiment

KARABANOV, I. A.	12/20/51	Master Sergeant, Aerial Gunner, 999th Ground Attack Regiment
KAS'YANOV, N. G.	5/15/46	Master Sergeant, Aerial Gunner, 566th Ground Attack Regiment
KELEYEV, N. T.	5/15/46	Sergeant, Aerial Gunner, 75th Guards Ground Attack Regiment
KIR'YANOV, A. I.	4/19/45	Master Sergeant, Aerial Gunner, 76th Guards Ground Attack Regiment
KLESHNIN, M. I.	5/15/46	Senior Sergeant, Aerial Gunner, 75th Guards Ground Attack Regiment
KLIMENKO, I. P.	5/15/46	Master Sergeant, Aerial Gunner, 953rd Ground Attack Regiment
LAGUNOV, F. I.	5/15/46	Master Sergeant, Chief of Squadron Communications, 34th Guards Bomber Regiment
MAKAROV, P. G.	5/15/46	Senior Sergeant, Aerial Radio Gunner, 511th Independent Air Observation Regiment /586
MALIKOV, N. I.	2/23/48	Master Sergeant, Aerial Radio Gunner, 124th Guards Bomber Regiment
MAMONTOV, A. G.	6/27/45	Sergeant, Aerial Gunner, 141st Guards Ground Attack Regiment
MARCHENKO, P. A.	5/15/46	Master Sergeant, Aerial Gunner, 952nd Ground Attack Regiment
MATVEYEV, D. I.	5/15/46	Master Sergeant, Aerial Gunner, 75th Guards Ground Attack Regiment
MOISEYEV, V. A.	4/19/45	Master Sergeant, Aerial Gunner, 74th Guards Ground Attack Regiment
NEFEDOV, G. N.	4/15/45	Senior Sergeant, Aerial Gunner, 74th Guards Ground Attack Regiment
OBUKHOV, F. M.	4/19/45	Senior Sergeant, Aerial Gunner, 74th Guards Ground Attack Regiment
OSIPOV, V. A.	5/15/46	Master Sergeant, Aerial Gunner, 136th Guards Ground Attack Regiment

PAPILOV, N. G.	5/15/46	Master Sergeant, Aerial Gunner, 956th Ground Attack Regiment
PELEVIN, K. YA.	6/29/45	Master Sergeant, Aerial Gunner, 15th Guards Ground Attack Regiment
PEPETYAT'KO, G. I.	5/15/46	Master Sergeant, Aerial Radio Gunner, 10th Independent Air Observation Regiment
PETRUHOVSKIY, M. D.	6/29/45	Sergeant, Aerial Gunner, 10th Independent Air Observation Regiment
RADCHENKO, I. S.	5/15/46	Senior Sergeant, Aerial Gunner, 136th Guards Ground Attack Regiment
ROMANOV, S. T.	4/19/45	Master Sergeant, Aerial Gunner, 75th Guards Ground Attack Regiment
SAVCHUK, N. V.	5/15/46	Senior Sergeant, Aerial Radio Gunner, 58th Bomber Regiment
SAMKOV, V. I.	6/29/45	Senior Sergeant, Aerial Gunner, 74th Guards Ground Attack Regiment
SARNYCHEV, N. M.	2/23/48	Senior Sergeant, Aerial Radio Gunner, 28th Guards Bomber Regiment
SIDEL'NIKOV, A. P.	4/19/45	Master Sergeant, Aerial Gunner, 136th Guards Ground Attack Regiment
SIDORENKO, V. V.	6/29/45	Master Sergeant, Aerial Gunner, 74th Guards Ground Attack Regiment
STEPANCHIKOV, A. P.	5/15/46	Master Sergeant, Aerial Gunner, 76th Guards Ground Attack Regiment
TURBIN, N. A.	6/29/45	Senior Sergeant, Aerial Gunner, 74th Guards Ground Attack Regiment
TYUTRYUMOV, A. N.	5/15/46	Master Sergeant, Aerial Gunner, 15th Guards Ground Attack Regiment
KHLYNIN, I. YE.	5/15/46	Master Sergeant, Aerial Gunner, 15th Guards Ground Attack Regiment
CHMIL', I. G.	5/15/46	Senior Sergeant, Aerial Gunner, 74th Guards Ground Attack Regiment
SHABANOV, V. M.	5/15/46	Master Sergeant, Aerial Gunner, 187th Guards Ground Attack Regiment

CHALIMOV, G. S.	5/15/46	Sergeant, Aerial Gunner, 74th Guards Ground Attack Regiment

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3. Important Dates in the History of Aviation and Cosmonautics /587

1754

12(1) June — M. V. Lomonosov built and tested a model helicopter, demonstrating the existence of aerodynamic forces capable of counterbalancing the pull of the earth.

1862

The Russian scientist K. I. Konstantinov was building rockets with two hollows (chambers) which assured controlled burning of the explosive material. Konstantinov's further inventions laid the foundation for the development of various types of rockets.

1869

18(6) December — In Petersburg, a commission was established in the War Ministry to adopt aeronautics to military uses.

1882

A. F. Mozhayskiy finished construction and began testing the worlds first airplane.

1897

October-November — I. V. Meshcherskiy published and defended his masters thesis, "The dynamics of a point of variable mass", which first gave the mathematical basis for the motion of a rocket.

1898

K. E. Tsiolkovskiy began his activities concerning rocket motion and space flight. The initial results of his investigations were published in May, 1903, in his work "Exploration of earth's space with rocket instruments".

1904

6 May (23 April) — At the Kuchino Station, near Moscow, the Aerodynamic Institute, organized by Professor N. Ye. Zhukovskiy, was opened.

1908 /588

29(16) January — The All-Russia Air Club was organized in Petersburg.

1910

The first school for military fliers began in Sevastopol.

1911

Fall — Aircraft took part for the first time in the troop maneuvers of the Warsaw Military District.

27(14) November — The First Russian Aerial Detachment was formed within the Fourth Siberian Aeronautic Company.

1912

19(6) June — G. Ye. Kotel'nikov's back-pack parachute system was successfully tested.

Designer D. P. Grigorovich built the "Flying Boat" seaplanes M-1, M-2, M-4.

1913

9 September (27 August) — The outstanding Russian pilot P. N. Nesterov successfully executed a "death loop" in a plane for the first time.

24(11) December — The first flight of a four-engine Russian bomber "Il'ya Muromets" took place.

1914

8 September (26 August) — The worlds first dog-fight occurred, in which P. N. Nesterov destroyed an enemy plane by battering it.

1916

24(11) September — For the first time, K. K. Artseulov executed a premeditated spin and pulled his plane out of it.

A Central Directorate within the War Ministry for Russian Aviation was established -- the Directorate of the Air Force, and the position of Field Inspector General of Aviation was established.

1917

23(10) July — The first All-Russian Aviation Congress opened in Moscow, at which the Aviation Council, the first public aviation organization, was formed.

10 November (28 October) — In Petersburg, at Smol'niy, the Bureau of Aviation and Aeronautics Commissars was formed within the

Revolutionary Military Committee. This was the first revolutionary organ for the direction of Soviet aviation.

1918 /589

2 January (20 December 1917)	The All-Russian Board for Direction of the Republic Air Force was founded.
7 February (25 January)	The Peoples' Commissariat for Army and Navy Affairs issued Order No. 84, which ordered all aviation units and schools preserved intact for the working people. In accordance with this order, the aviation detachments of the old army were not demobilized, but were reformed into air detachments of the Soviet Air Fleet.
24 March	The "Flying Laboratory" was built at the Central Moscow Airport to carry out research on improvement of aircraft and aircraft engine quality.
April	The special Baltic Air Brigade was formed -- the First Naval Air Unit.
24 May	The Main Directorate of the Workers' and Peasants' Red Air Force was established under Order No. 385 of the Peoples' Commissar for Army and Navy Affairs.
22 September	The Field Directorate for Aviation and Aeronautics of the Field Forces (AVIADARM) was formed as a part of the Revolutionary Military Council of the Republic. Subsequently, in 1920, AVIADARM merged with the Main Directorate of the RKK VVF.
November	V. I. Lenin visited the Moscow School of Aviation.
1 December	The Central Aerohydrodynamic Institute (TsAGI), headed by Professor N. Ye. Zhukovskiy, was created.

1919

Spring	The first Soviet aviation manual was published. It was a compilation of the military uses of aviation by the RKKA in a war of maneuver.

1920

26 September	The N. Ye. Zhukovskiy Institute for Red Air Force Engineers was organized. It was reorganized in 1922 as the Air Engineers Academy. (The first class graduated on 25 April 1925.)
3 December	The Council of Peoples' Commissars passed a resolution signed by V. I. Lenin to commemorate the 50th Anniversary of N. Ye. Zhukovskiy's scientific activities.

21 September — An experimental airport was founded which later grew into the Scientific Testing Institute of the VVS. This was the basic center of research on the military capabilities of the new aviation technology of the Air Force.

1921 /590

17 January — V. I. Lenin signed the Council of Peoples' Commissars Decree "On air traffic in air space over the RSFSR territory and its territorial waters".

1922

1 May — The first International Passenger Airline was opened between Soviet Russia and Germany: Moscow to Koenigsberg.

8 July — The worlds first experiments on using aviation to combat agricultural pests were conducted at the former Khodynskiy Airport.

15 July — The Soviet Unions first regular airline was opened on the Moscow - Nizhniy Novgorod (Gor'kiy) route.

C. A. Chaplygin's work "On general monoplane wing theory" was published. In this work the scientist presented the world's first complete theory on monoplane wings.

1923

9 February — The Council on Civil Aviation was formed. This was the beginning of the Civil Air Fleet organization.

8 March — On the initiative of V. I. Lenin, the Society of Friends of the Air Float (ODVF) was organized. On 11 November, members of the ODVF transferred nine aircraft from their "Ul'timatum" Detachment to the Air Force.

1924

15 April — The Main Directorate of the Workers' and Peasants' Red Air Fleet was renamed the Directorate of the Air Force. P. I. Baranov was named to head the Directorate in December, and in 1931, Ya. I. Alksnis was named as Chief.

May-June — The Society for the Study of Interplanetary Communications (OIMS) was organized in the USSR.

September — Air Detachments began to be combined into squadrons. The squadrons were grouped according to aviation arms -- reconnaissance, fighter, ground attack, and the light and heavy bomber. Later air squadrons were combined into air brigades.

Test flights were conducted on a two-seat, single-motor biplane designed by N. N. Polikarpov. It had the first Soviet series motor, the M-5. Mastery of native military aircraft had begun.

1925

13 March — ODVF and Dobrokhim (the Volunteer Society to help build the Chemical Industry, organized 19 May 1924) merged into the United Society of Friends of Air-Chemical Defense and Production of the USSR (Aviakhim).

10 June-13 July — A flight of six Soviet planes from Moscow to Ulan-Bator to Peking was completed. Shortly there after, our aviators, in native aircraft, completed a whole series of flights: to Ankaru (1925), Tegeran (1926), to the capitals of Europe (1926), to Tokyo (1927), to New York (1929), and others. /591

November — Flight tests were completed on the TB-1, a two-motor, all metal monoplane built under the leadership of A. N. Tupolev. This plane was the prototype for the multi-motor heavy bombers TB-3 and "Maksim Gor'kiy" which were built soon after.

1928

January — The U-2 (Po-2), designed by N. N. Polikarpov using the M-11 engine, was successfully flight tested. This plane was long used to train young fliers, and was used during World War II as a light night bomber.

1929

25 February — The Central Committee of the Communist Party passed a resolution "On the command and political structure of the RKKA", which was used as a foundation for the training of air personnel.

15 July — The Central Committee of the Communist Party passed a resolution "On the defense posture of the USSR", which, among other things, outlined the major missions concerning the development of the Air Force.

1930

August — The Central Institute for Aircraft Engine Construction was founded.

19 October — The All-Union Society of the Civil Air Fleet (VOGVF) was formed within the Council of Work and Defense of the USSR.

1931

25 January — In its ninth meeting, the All-Union Lenin Communist Youth League became a patron of the Air Force

November — The Moscow and Leningrad Groups for the Study of Rocket Motion (MosGIRD and LenGIRD) were organized within their respective Osoaviakhim's (Society for Aid in Defense of the Aviation-Chemical Industry).

1932

25 February — The Main Directorate of the Civil Air Fleet was organized within the Council of Peoples' Ministers of the USSR.

23 December — A special commission was formed to investigate the practical uses for the world's first aircraft jet engine, the OR-2, developed by F. A. Tsander.

F. A. Tsander's book, "Problems of flight using jet engines", was published.

1933 /592

28 April — The Council of Peoples' Commissars of the USSR passed a resolution establishing a yearly holiday -- The Day of the Air Fleet of the USSR -- which was first observed 18 August 1933.

A high-speed fighter, the I-15, designed by N. N. Polikarpov, was successfully flight tested. This plane was later developed into the I-15-2 and the I-153.

1934

February — The Jet Scientific Research Institute (RNII) was established in Moscow.

20 April — For their rescue of the crew members of the "Chelyuskin", the following fliers became the first Heroes of the Soviet Union: A. V. Lyapidevskiy, S. A. Levanevskiy, V. S. Molokov, N. P. Kamanin, M. T. Slepnev, M. V. Vodop'yanov and I. V. Doronin.

October-December — Successfull flight testing was carried out on the two-motor, all metal bomber SB.

1935

11 March — The Central Air Club of the USSR was formed, to become the center of all Soviet sport aviation activity.

May — The I-16, a high-speed monoplane fighter designed by N. N. Polikarpov, was successfully flight tested.

1936

1 February — The USSR joined the International Aviation Federation (FAI).

1937

18-20 June — The crew of a ANT-25 plane, pilots V. P. Chkalov and G. F. Baydukov, and navigator A. V. Belyakov, made history's first non-stop flight from Moscow to America over the North Pole. In July the same flight was made by the crew of another ANT-25, M. M. Gromova, A. B. Yumashev and S. A. Danilin.

1938

January — Naval Aviation ceased to be a part of the Air Force of the RKKA and became an independent arm of the Navy.

24-25 October — The crew of the aircraft "Rodina", M. M. Raskova, P. D. Osipenko, and V. S. Grizodubova, made a non-stop flight from Moscow to the Far East.

1939 /593

August — In air battles with Japanese interceptors, near the Khalkhin River, "RS-82" (air-to-air) rocket armaments were used for the first time.

29 August — Pilots S. I. Gritsevets and G. P. Kravchenko became the first two-time Heroes of the Soviet Union.

1940

20 February — The first gliding flights were made by pilot V. K. Fedorov in the liquid-fuel rocket plane "SK-9", designed by S. P. Korolev.

29 March — The Peoples' Commissar of Defense issued an order on the creation of the Military Academy for Commanders and Navigation Officers of the Air Force (formerly the Red Banner Military Air Academy).

1941

25 February — The Party Central Committee passed a resolution "On the reorganization of Red Army Aviation", which took account of a number of measures designed to further heighten the military might of the Soviet Air Force. These measures had

to be carried out in 1941 and the first half of 1942.

22-25 June — Air Forces of the Northern, North Western, Western, South Western, and Southern Fronts were created out of the Western Border Military District Air Forces.

23 June — On the basis of a resolution of the Council of Peoples' Commissars, the Civil Air Fleet became operationally subordinate to the Peoples' Commissariate of Defense. The regulations for operation of the Civil Air Fleet during war-time were confirmed.

29 June — In place of the Chief of the VVS Directorate, there was created the office of Commander of the Red Army Air Force, having the rights of a deputy to the Peoples' Commissar of Defense. A military council and headquarters were created for the commander.

22 July — Soviet fighter pilots and air defense antiaircraft artillery successfully repulsed the first mass attack on Moscow by more than 250 fascist bombers, destroying 22 of the enemy aircraft.

8 August — On the night of August 8th, a group of Baltic Fleet Air Force bombers carried out the first strike against the German capital -- Berlin.

6 December — Six Air Force regiments were transformed into Guards Regiments. In all during the war, 288 air groups, units and sub-units of the Air Force received the Guards Banner.

1942

5 March — Regiments and divisions of the long-range bomber aviation were combined into Long-Range Aviation, which was directly subordinate to the headquarters of the VGK (Supreme Commander in Chief).

5 May — Air armies began to be formed on the basis of the army and front aviation. In all, 17 air armies of the front aviation were formed during the war out of aerial corps and divisions. /594

15 May — Pilot G. Ya. Bakhchivandzhi made the first flight in a liquid fuel rocket plane designed by V. F. Bolkhovitinov.

9 November — The military manual for Red Army troops was published, which contained the basis for aerial attack.

1943

2 February — The counterattack by Soviet troops in Stalingrad ended in complete victory. During the counterattack, Soviet Air Forces carried out a successful air blockade of the surrounded enemy forces.

1944

20 August — Colonel A. I. Pokryshkin became the country's first three time Hero of the Soviet Union.

In August, 1945, the same title was awarded to Major I. N. Kozhedub.

6 December — Long-Range aviation was reorganized into the 18th Long-Range Air Army, subordinate to the Commander of the Red Army Air Forces.

1945

9 May — The Great Fatherland War against fascist Germany ended. During the war, the Soviet Air Forces won supremacy in the air, destroyed the fascist-German aviation, and contributed greatly to victory over the enemy.

2 September — Soviet Armed Forces successfully crushed the Kwantung Army in the Far East. Our Air Forces managed to assure the irresistible operations of the land forces and brilliantly carried out their duty to the fatherland.

1946

24 April — The first flights in jet planes were made by A. N. Grinchik in a Mig-9 and M. I. Ivanov in a Yak-15.

18 August — The first post-war air show was held to Tushino, in which Soviet jet planes participated for the first time.

1947

5 February
16 May
20 September — Orders of the Presidium of the Supreme Soviet of the USSR were issued pertaining to the awarding of orders and medals of the Soviet Union to flight and technical personnel for their mastery of new aviation technology. During the year, a total of 700 pilots, navigators, engineers and technicians were decorated. This testifies to the great attention paid by the Party and the government to Soviet aviation, and equipping it with jet aircraft. /595

1949

25 September — A TASS announcement was published that the Soviet Union had achieved an atomic explosion.

1950

The Council of Ministers of the USSR adopted a decision

to classify flight personnel.

1955

Personnel in air units began to train in the use of nuclear weapons.

1956

15 September — The first regular passenger service on turbojet aircraft began with the flights of a TU-104 aircraft.

1957

August — The USSR made the world's first launch of a multi-stage, intercontinental ballistic missile.

4 October — The world's first artificial earth satellite was launched (achieving orbital velocity).

October — A Plenum of the Central Committee of the Communist Party of the Soviet Union adopted a resolution "On improving Party-political work in the Soviet Army and Navy", which laid the foundation for the educational work of commanders, political organs, Party and young-communist organizations in units of the Air Forces.

1958

21 March — In the Kremlin, a reception was organized for graduates of the Air Forces Engineering Academies. This was a clear illustration of the Communist Party's and Soviet Government's concern and attention for aviation personnel.

30 August — The Presidium of the Supreme Soviet of the USSR established the honorary title, "Honored test pilot of the USSR", and "Honored test navigator of the USSR".

In accordance with the decision of the Soviet government, pilot and navigator schools were reorganized into higher military aviation schools, which graduate pilot-engineers and navigator-engineers.

1959

2 January — The world's first lunar probe was launched. (Achievement of escape velocity.)

12 September — The USSR launched the second spacecraft to the moon. It landed on 14 September.

4 October — The launch of the third Soviet spacecraft took place, with the object of photographing the backside of the moon.

1960

15 May — The first Soviet satellite ship was put into earth orbit. The craft's gross weight after separation from the last stage of the carrier rocket was 4,540 kilograms.

1961

12 April — The Soviet spacecraft "Vostok", with Cosmonaut Major Yu. A. Gagarin on board, became the world's first manned earth satellite. The craft completed one revolution around the earth and successfully landed.

6 August — The "Vostok-2" spacecraft, piloted by Cosmonaut Major G. S. Titov, was launched from the Baykonur cosmodrome. The flight lasted about two days, with the craft completing 17 earth orbits and successfully landing in the assigned area.

1962

11-15 August — Cosmonauts Major A. G. Nikolayev and Lieutenant Colonel P. R. Popovich, in the "Vostok-3" and "Vostok-4" spacecraft, successfully completed the first group flight.

1963

14-19 April — The second group flight was completed by the "Vostok-5" and "Vostok-6" spacecraft, which carried on board Cosmonauts Lieutenant V. F. Bykovskiy and the world's first female Cosmonaut, Captain V. V. Tereshkova.

1964

12 October — The world's first flight around the earth by a three-seat craft was completed in the "Voskhod" by Cosmonauts V. M. Komarov, K. P. Feoktistov and B. B. Yegorov.

10 April — Sports fliers in the Soviet Union began to master jet aircraft.

27 July — By order of the Presidium of the Supreme Soviet of the USSR, an All-Union Ministry of Civil Aviation, USSR, was created out of the Main Directorate of the Civil Air Fleet within the Council of Ministers, USSR.

1965 /5

26 April — The Presidium of the Supreme Soviet of the USSR created the honorary titles, "Honored military pilot of the USSR" and "Honored military navigator of the USSR".

18 March — The "Voskhod-2" spacecraft was put into orbit, with Cosmonauts Colonel P. I. Belyayev and Lieutenant Colonel A. A. Leonov on board. On the second revolution, A. A. Leonov made the world's first exit from a spacecraft into outer space.

1966

3 February — The Soviet automatic station "Luna-9" made history's first soft landing on the moon and accomplished the first radio television transmission to earth.

31 March — A rocket containing the automatic station "Luna-10" was launched. The "Luna-10" became the first artificial moon satellite.

* * *

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Cover Page Source

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